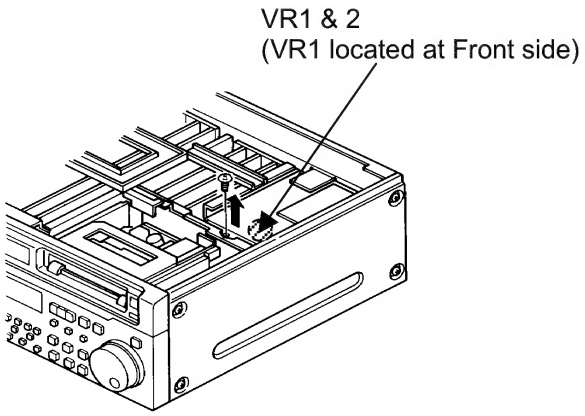
1. POWER

1-1. ＋5V and ＋12V Confirmation & Adjustment

BOARD	POWER 2
SPEC.	5V: 5.1V±0.1V 12V: 11.8V±0.6V
TEST	TP6 (+5V), TP12 (+12V) (SYSCON BOARD:F2)
ADJUST	VR1 (+5V), VR2 (+12V)
INPUT	----------
MODE	EJECT
M.EQ	Digital Volt Meter

1. After connect the test point on SYSCON Board, turn the power ON.
2. Confirm that the voltage at TP6 and 12 in the specification.
3. If it is not, adjust VR1 and VR2 so that the voltage in the specification.



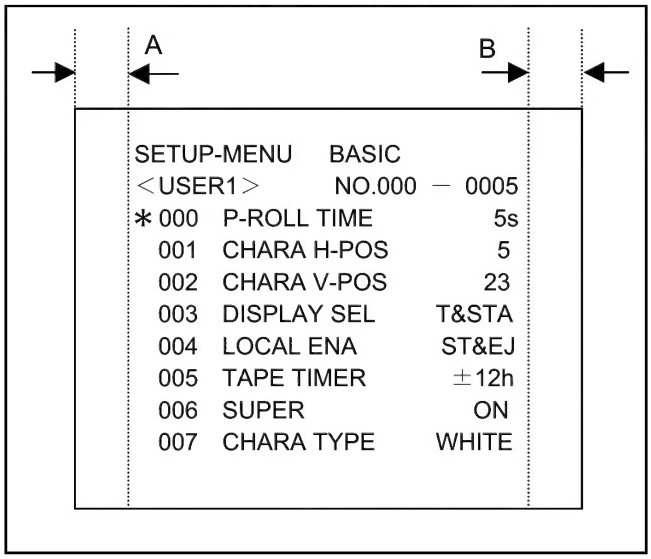
2. SYSTEM CONTROL

2-1. Super Impose Position Adjustment

BOARD	SYSCON (F2)
SPEC.	A = B
TEST	MONITOR
ADJUST	VC1
INPUT	----------
MODE	EJECT
M.EQ	Monitor TV

1. Press the MENU , and displayed the SETUP-MENU.
2. Adjust VC1 so that the width A and B are equal.
3. Press the MENU button, and finished the SETUP-MENU.

4. **NOTE:** The display of menu may be different the above figure.

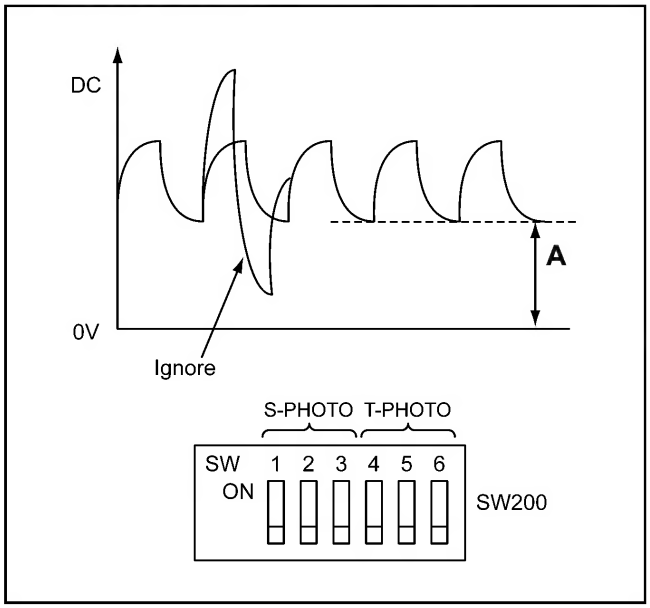


3. MECH INTERFACE

3-1. Photo Sensor Voltage Adjustment

BOARD	MECH INTERFACE
SPEC.	A = 3.1～4.2VDC
TEST	Pin 25 of Connector P2 (Supply) Pin 26 of Connector P2 (Take Up) (SYSCON BOARD)
ADJUST	DIP SW200 (MECH I/F BOARD)
INPUT	----------
MODE	EJECT
M.EQ	Oscilloscope VFK1423 (Tape Big./End Det. Cassette)

1. Remove the Bottom Panel.
2. Insert the VFK1423 and measure the voltage at Pin 25 and 26 of connector P2.
3. Set the Dip SW200 so that the DV voltage “A” in the specification.



SW1	SW2	SW3	S-PHOTO	Synthetic
SW4	SW5	SW6	T-PHOTO	Resistance
ON	ON	ON	A Voltage	420Ω
OFF	ON	ON	UP	460Ω
ON	OFF	ON	↑	660Ω
OFF	OFF	ON		750Ω
ON	ON	OFF		880Ω
OFF	ON	OFF	↓	1050Ω
ON	OFF	OFF	A Voltage	3300Ω
OFF	OFF	OFF	DOWN	8200Ω

4. SERVO

4-1. Motor Torque Offset Adjustment

BOARD	SERVIO (F1)
SPEC.	15±2grcm (5 times average)
TEST	Connect Monitor TV to VIDEO OUT3
ADJUST	A03:T-REEL TRQ A04:S-REEL TEQ (EVR on Service Menu)
INPUT	----------
MODE	EJECT
TAPE	No Tape
M.EQ	VFK1191 (Dial Torque Gauge) VFK1152 (Dial Torque Gauge Adapter)

1. Set the REEL TABLE to M-cassette position.
2. Remove the Front Loading Unit with the connection cable or remove the Top Plate of Front Loading Unit, which is fixed by 6 screws.
3. Open the SERVO ADJUST menu on the Service menu and select the item “ A03:T REEL TRQ “.
4. Set a Dial Torque Gauge to top of Take-up Reel Table.
5. Press the STOP button at 5 times and measure the value of Dial Torque Gauge at 5 times, then calculate the average and adjust EVR “T REEL TRQ” so that the average is in the specification.

Note: While press the STOP button, the REEL Table is rotated

6. Select the item “ A04:S REEL TRQ ”.
7. Set a Dial Torque Gauge to top of Take-up Reel Table.
8. Press the STOP button at 5 times and measure the value of Dial Torque Gauge at 5 times, then calculate the average and adjust EVR “S REEL TRQ” so that the average is in the specification.

5.EQ and RF Adjustment

EQ and RF adjustment can be executed by RF AUTO EQ software and RF AUTO ADJUSTMENT TOOL.

This Service Manual mention of auto adjust procedure and manual adjustment procedure.

5-1. AUTO ADJUSTMENT PROCEDURE

5-1-1. Preparation and Connection of Auto EQ Adjustment Tool

Test Point	TP2:PB HSW, TG1:GND (RF AMP Board:H4) TP17:PB ENV, TG7:GND (RF AMP Board:H4)
Equipment	・RF Auto Adjustment Tool(VFK1163) ＊ This Tool attached 2 kinds of cable ・RF Adjustment Software(VFK1160C) ・IBM PC Compatible(486/66MHz or greater) ・DAQ－12 A/D Card(Quatech): ＊ This Board is install to PC as same as LISTA ADJ. ・DC Power Supply(+8.5V to +12V) ・RS－232C Cable(type of Cross cable)
Tape	**NTSC:**VFM3580KM(DVCPRO), VFM3010EDS(DV) **PAL:**VFM3680KM(DVCPRO), VFM3110EDS(DV) Self－recording and Playback Tape

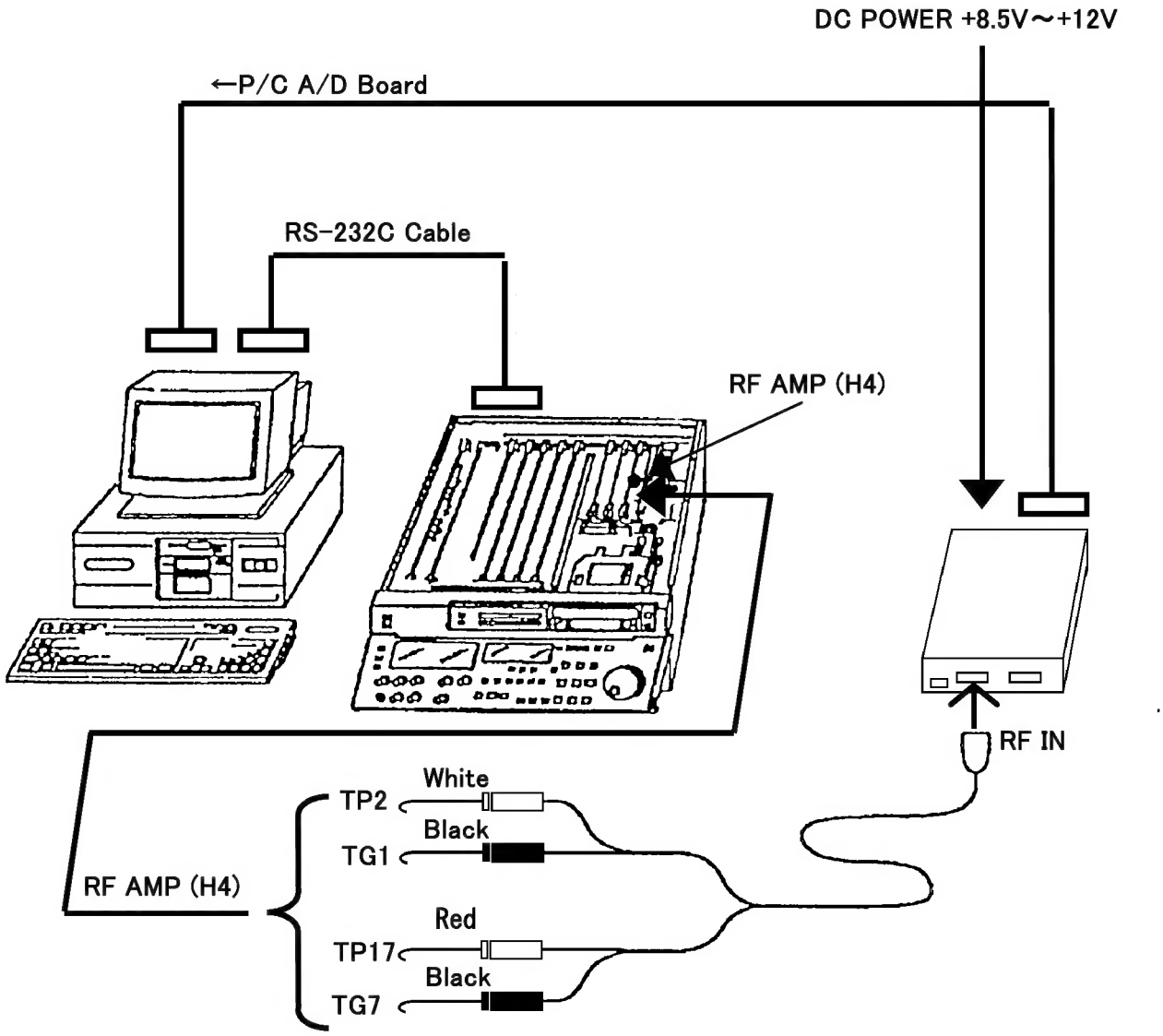
1. Supply DC Voltage(+8.5 to +12V) to EQ Tool. RF Adjustment Tool requires DC power supply(+8.5V to +12V). Use DC power supply or AC Adaptor movie like " VW－AMC1 ".
2. Connect the extension board with RF AMP (H4) board and connect the clip of cable from EQ tool to Test Point follow as below table on the RF AMP P.C.Board.

WHITE CLIP	TP2	RED CLIP	TP17
BLACK CLIP	TG1	BLACK CLIP	TG7

3. Connect the 62 pin D－Sub connector of cable from EQ tool to A/D Board of PC.
4. Connect the RS232C cable to between VTR and PC.

.

Connection


DC POWER +8.5V～+12V
←P/C A/D Board
RS-232C Cable
RF AMP (H4)
RF IN
White
TP2
Black
TG1
RF AMP (H4)
Red
TP17
Black
TG7

Initial Setting

< Setting of VTR >

1. Open the Set Up Menu in User mode (do not use Service Mode) and confirm the menu is in <USER1> and set the RS-232C mode as shown below..

204	RS232C SEL	ON
205	BAUD RATE	9600
206	DATA LENGTH	8
207	STOP BIT	1
208	PARITY	NON
209	RETURN ACK	ON

2. Press SET button after setting the above items.
3. Set the LOCAL / REMOTE SW to REMOTE side.

During Automatic EQ adjustment, adjustment is done with ALIGNMENT tape, so rewind the necessary amount of adjustment tape (DVCPRO MASTER and DV MASTER tape) before boot up the EQ automatic adjustment software.

NOTE: When the VTR detected tape end position during adjustment, rewind the tape automatically to tape beginning position and continuation of adjustment.

Boot Up the RF Automatic Adjustment Software.

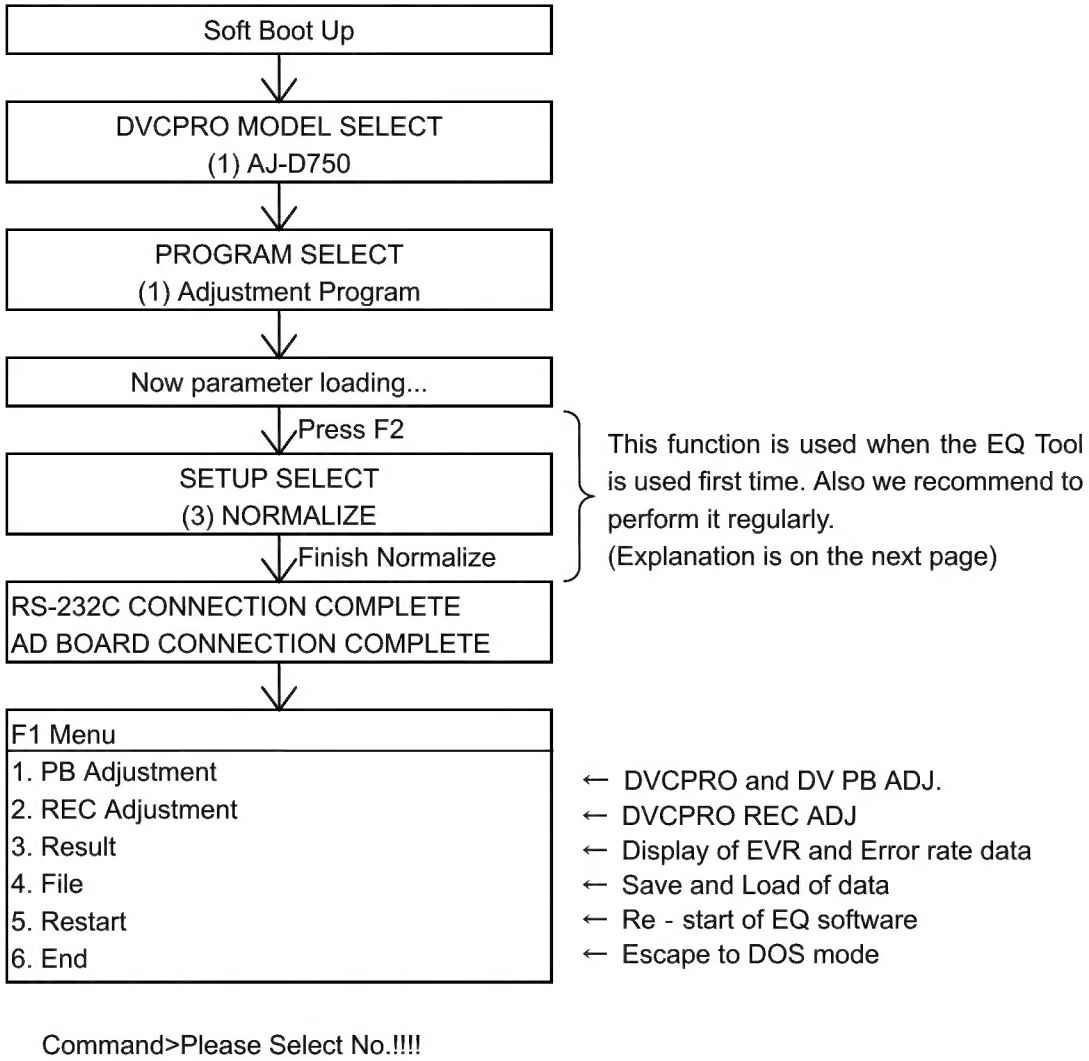
1. Boot Up the EQ Adjustment software after setting and connection.

   ★ Install and boot up

   Copy the all files in the floppy disk of EQ adjustment software to hard disk(for example as directly " RF ADJ " : C:¥RFADJ).

   Executive file is DVCRF, so type " DVCRF " and press Enter, then boot up Auto EQ software.

2. Before boot up software, please confirm the tape does not into VTR and LOCAL/REMOTE switch on the front panel set to REMOTE side.
3. After boot up software, appear the message " DVCPRO MODEL SELECT " on the screen, then select the model. In case of the AJ - D440/450, select the item 「(1) AJ - D750」.
4. Next select item 「(1) Adjusting Program」 on the " PROGRAM SELECT " menu.
5. After item 4 the parameter loading menu is appeared and wait about 20 second. This waiting time can be skipped by pressing ENTER key. Then "RS-232C CONNECTION COMPLETE", "AD BOARD CONNECTION COMPLETE" messages and Main Menu are appeared.


Soft Boot Up
DVCPRO MODEL SELECT
(1) AJ-D750
PROGRAM SELECT
(1) Adjustment Program
Now parameter loading...
Press F2
SETUP SELECT
(3) NORMALIZE
Finish Normalize
This function is used when the EQ Tool is used first time. Also we recommend to perform it regularly.
(Explanation is on the next page)
RS-232C CONNECTION COMPLETE
AD BOARD CONNECTION COMPLETE
F1 Menu
1. PB Adjustment
2. REC Adjustment
3. Result
4. File
5. Restart
6. End
← DVCPRO and DV PB ADJ.
← DVCPRO REC ADJ
← Display of EVR and Error rate data
← Save and Load of data
← Re - start of EQ software
← Escape to DOS mode

Command>Please Select No.!!!!

☆Normalize of RF AUTO ADJUSTMENT TOOL

Press <F2> enter to SET UP, then appeared display as below.

```
SETUP SELECT

(1) RS-232C
(2) AD
(3) NORMALIZE
(4) PRGKIND
(5) END

INPUT No!! or Select by cursor Key (U/D) and hit RETURN
```

Please select the "(3) NORMALIZE", and press Enter key, then appeared message " Play back the DVCPRO MASTER TAPE, Then PRESS ENTER Key ".

Insert DVCPRO color bar alignment tape and press Enter key, then measurement value appeared as indicated as below.

```
Tool BOX Normalizing

                5MHz BPF    10MHzBPF    20MHzBPF      APF
USER DATA       0.025028    0.032613    0.030525    0.011855
DEFAULT DATA    0.028084    0.031761    0.030125    0.011872

Normalizing Again? [Y/N]
```

When you use RF Adjustment Tool first time, please confirm that the value of USER DATA and DEFAULT DATA, which should be difference within +/- 0.01.

When performing this normalization regularly under condition of the same combination of the PC, A/D Board and EQ Tool, the difference of USER DATA and DEFAULT DATA should be with in +/- 0.005.

If USER DATA value is became out of spec, RF Adjustment Tool (VFK1163) have a problem.

In case of the data within spec, please select the "N", the appear the massage below.

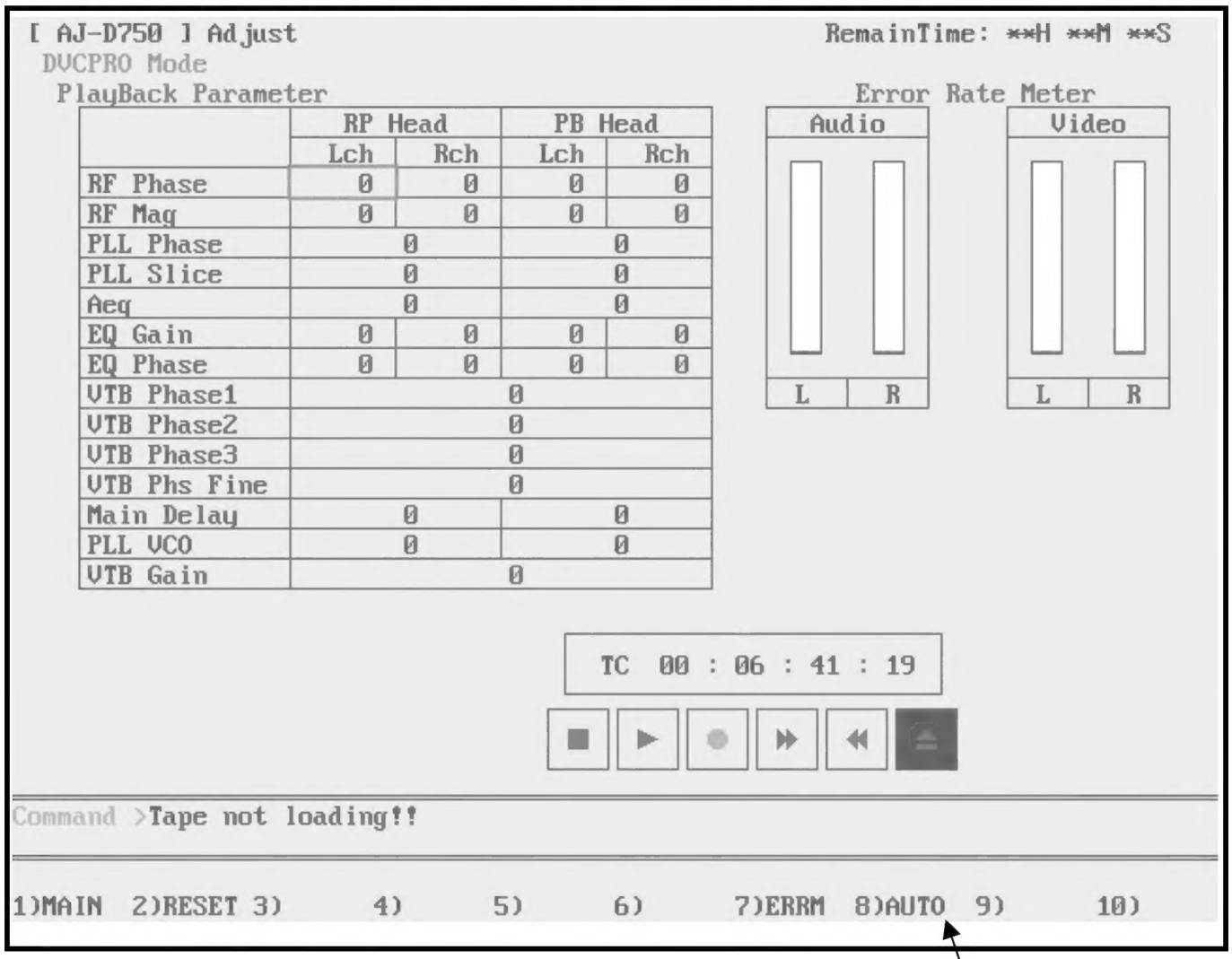
```
Please Select (U)ser / (D)efault!
```

Please select "U ", then appeared SETUP SELECT Menu.

Eject the tape and select "(5) END ", then the screen return to parameter loading.

5-1-2. DVCPRO Playback Adjustment

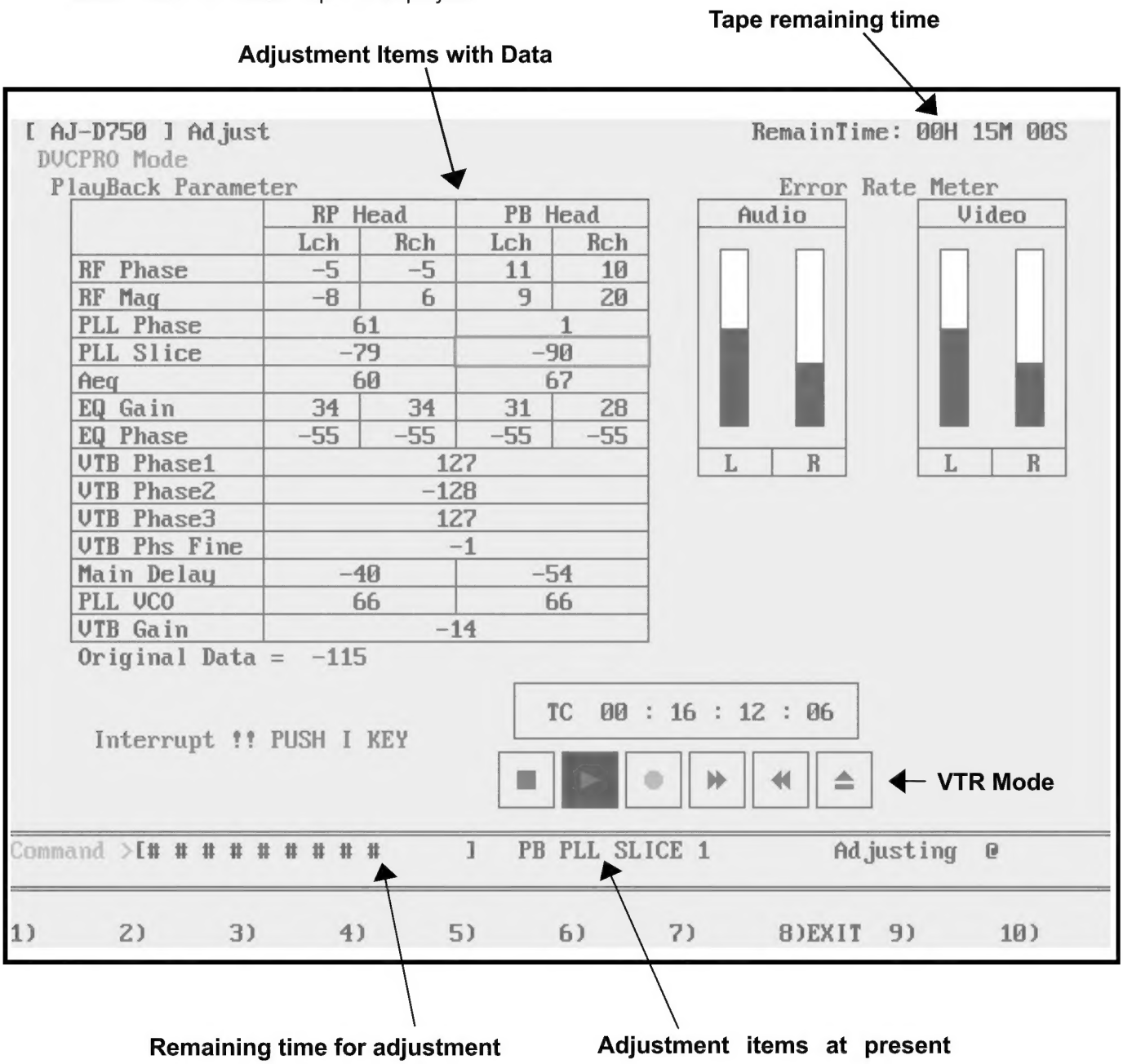
1. Select “1. PB Adjustment” in the Main Menu.
2. Adjustment menu is appeared. “Tape not loading !!” message is appeared, press F8 key (AUTO) for automatic adjustment. The bottom numbers show the Function keys.



	RP Head		PB Head	
	Lch	Rch	Lch	Rch
RF Phase	0	0	0	0
RF Mag	0	0	0	0
PLL Phase	0		0	
PLL Slice	0		0	
Aeq	0		0	
EQ Gain	0	0	0	0
EQ Phase	0	0	0	0
VTB Phase1	0			
VTB Phase2	0			
VTB Phase3	0			
VTB Phs Fine	0			
Main Delay	0		0	
PLL VCO	0		0	
VTB Gain	0			

3. In the SELECT MENU, select “1. ALL Adjustment”.
4. Then the message of “PLEASE INSERT DVCPRO MASTER TAPE” is appeared in the former adjustment menu, insert DVCPRO MASTER (VFM3580KM : NTSC) or (VFM3680KM : PAL).

5. The following picture is appeared and automatic adjustment is started. During automatic adjustment, do not touch VTR and PC.
6. Adjustment is completed in 7 or 8 minutes. Then DV Playback adjustment is started. At bottom of the screen, “Please insert DV master Tape” is displayed.

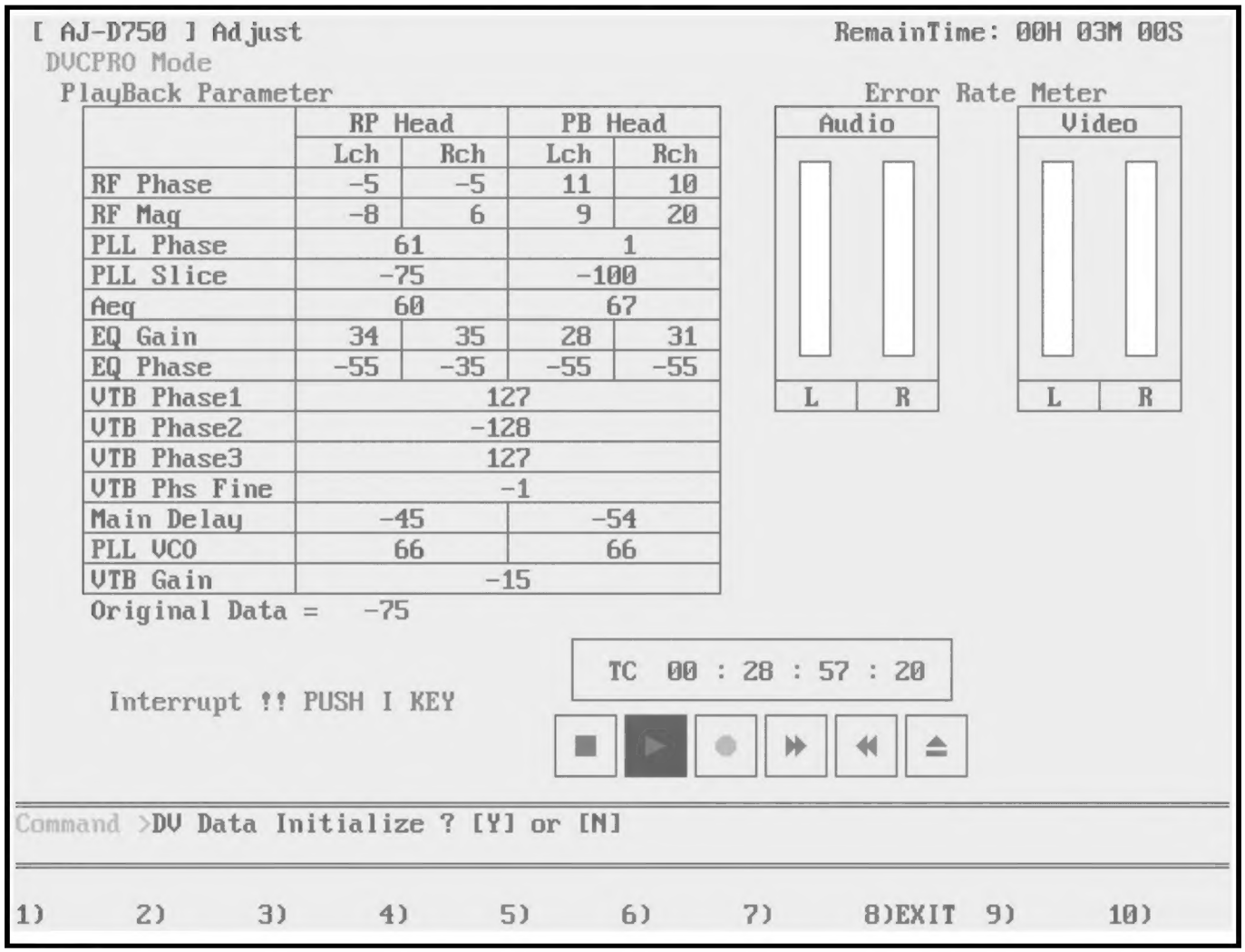

Tape remaining time
Adjustment Items with Data
[AJ-D750] Adjust
RemainTime: 00H 15M 00S
DVCPRO Mode
PlayBack Parameter
Error Rate Meter
Audio
Video
L
R
L
R
Original Data = -115
TC 00 : 16 : 12 : 06
Interrupt !! PUSH I KEY
VTR Mode
Command >[# # # # # # # # # #] PB PLL SLICE 1 Adjusting @
1) 2) 3) 4) 5) 6) 7) 8)EXIT 9) 10)
Remaining time for adjustment
Adjustment items at present

	RP Head		PB Head	
	Lch	Rch	Lch	Rch
RF Phase	-5	-5	11	10
RF Mag	-8	6	9	20
PLL Phase	61		1	
PLL Slice	-79		-90	
Aeq	60		67	
EQ Gain	34	34	31	28
EQ Phase	-55	-55	-55	-55
VTB Phase1	127			
VTB Phase2	-128			
VTB Phase3	127			
VTB Phs Fine	-1			
Main Delay	-40		-54	
PLL VCO	66		66	
VTB Gain	-14			

5-1-3. DV (Consumer) Playback Adjustment

This adjustment is done following DVCPRO Playback adjustment.

1. Tape is automatically ejected after DVCPRO Playback Adjustment. Insert DV MASTER Tape when “Please Insert DV MASTER” message is appeared.
2. When “DV Data Initialize?” [(Y)es or (N)o]” message is appeared, select N.
3. DV Playback automatic adjustment is started.
   During automatic adjustment, do not touch VTR and PC.

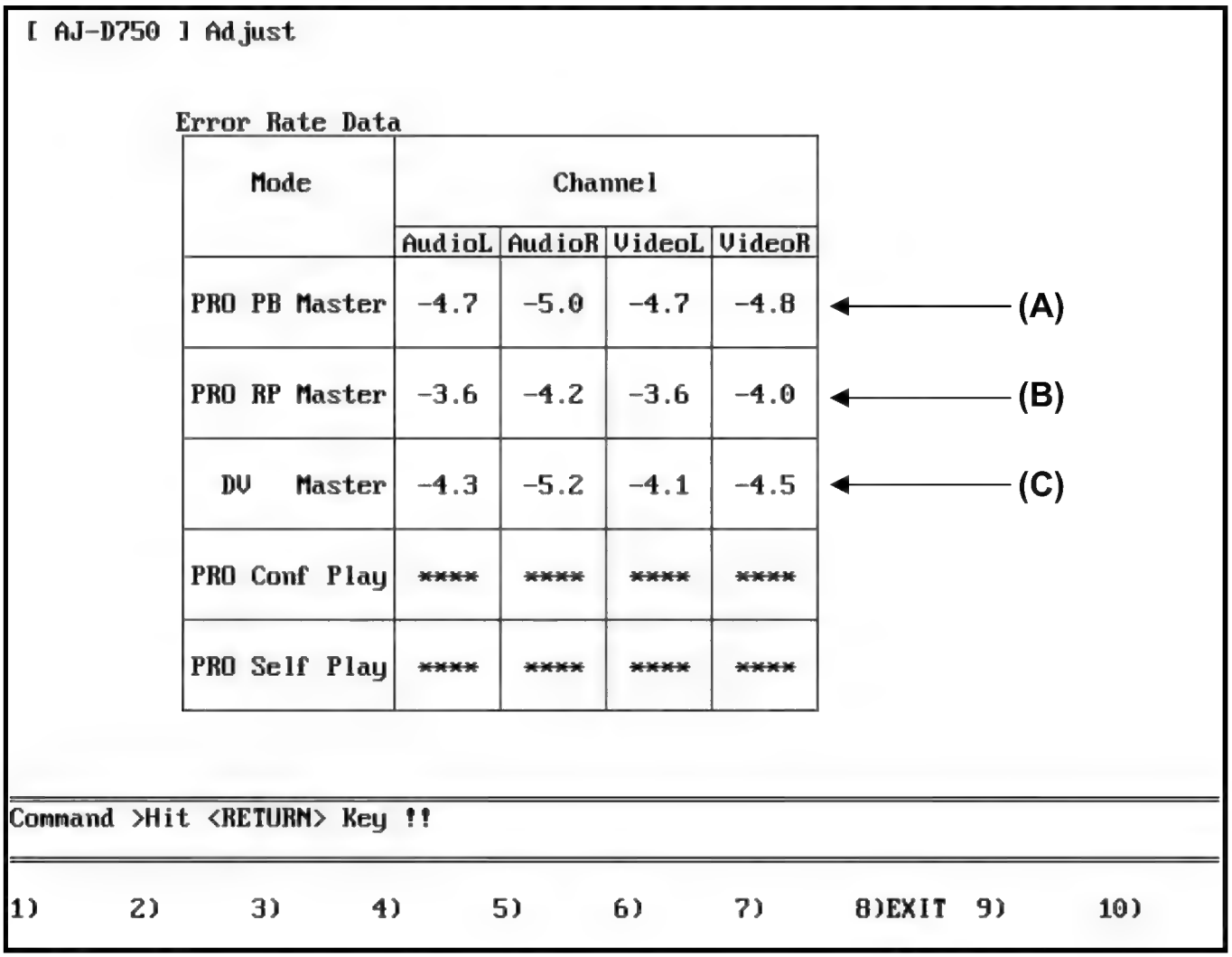


	RP Head		PB Head	
	Lch	Rch	Lch	Rch
RF Phase	-5	-5	11	10
RF Mag	-8	6	9	20
PLL Phase	61		1	
PLL Slice	-75		-100	
Aeq	60		67	
EQ Gain	34	35	28	31
EQ Phase	-55	-35	-55	-55
VTB Phase1	127			
VTB Phase2	-128			
VTB Phase3	127			
VTB Phs Fine	-1			
Main Delay	-45		-54	
PLL VCO	66		66	
VTB Gain	-15			

Original Data = -75

5-1-4. Confirmation of Error Rate (PLAYBACK)

1. After DVCPRO and DV Playback adjustment, measured error rate is automatically displayed as shown below.



[AJ-D750] Adjust

Error Rate Data

Mode	Channel				
	AudioL	AudioR	VideoL	VideoR	
PRO PB Master	-4.7	-5.0	-4.7	-4.8	◄—— (A)
PRO RP Master	-3.6	-4.2	-3.6	-4.0	◄—— (B)
DV Master	-4.3	-5.2	-4.1	-4.5	◄—— (C)
PRO Conf Play	****	****	****	****	
PRO Self Play	****	****	****	****	

Command >Hit <RETURN> Key !!

1) 2) 3) 4) 5) 6) 7) 8)EXIT 9) 10)

2. Confirm the numbers at (A), (B) and (C) they are displayed in Green.
   If the color is red the error rate is too high.
   Especially the numbers at (A) and (C) must be Green. If part of row of (B) is red, clean the head and the tape transportation and re-adjust the DVCPRO RP Playback adjustment.

<Procedures>

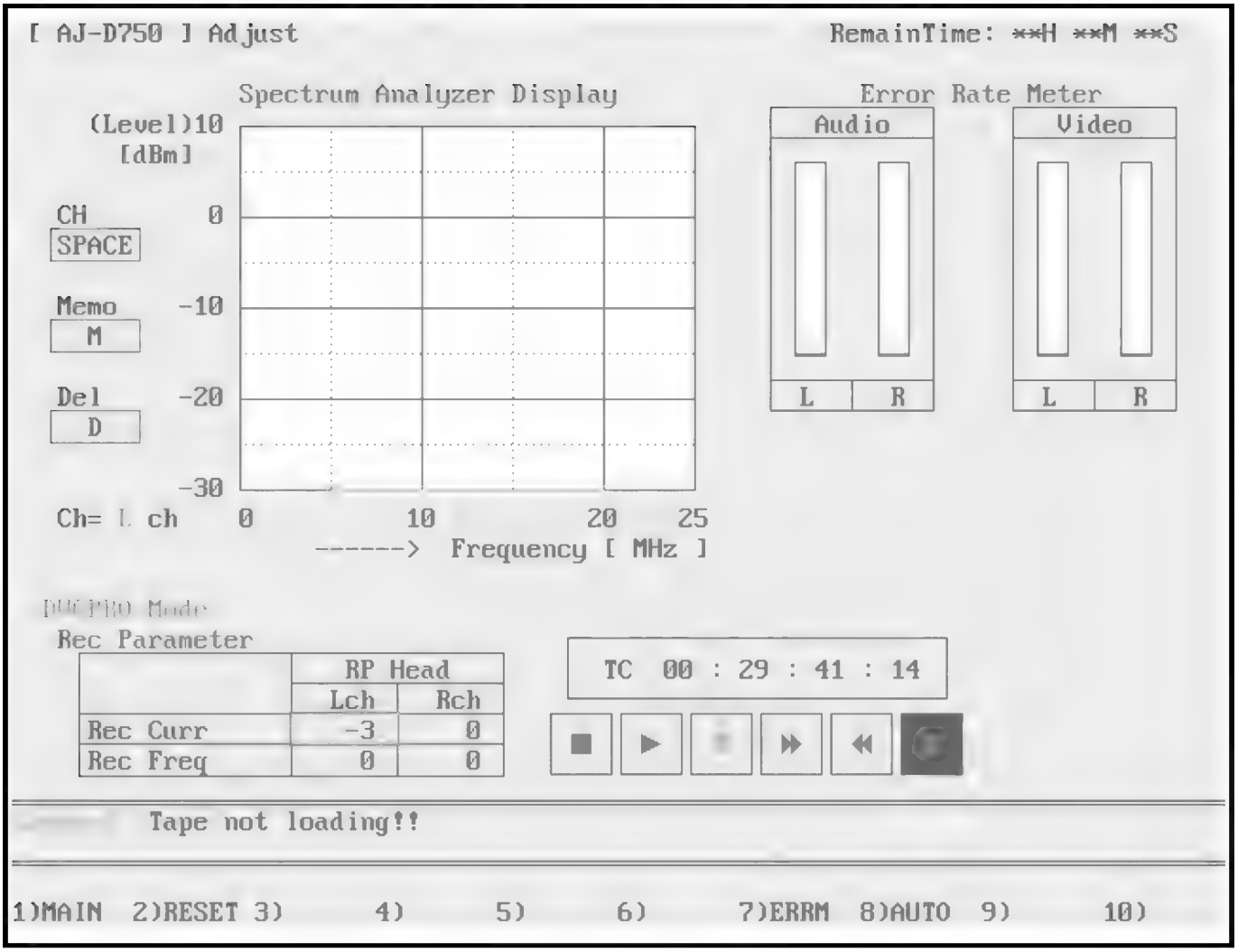
1. If Return key is pressed, Select Menu is displayed and select “3. DVCPRO RP ONLY Adjustment”. Then follow the message on PC and re-adjust RP mode only.
2. After adjustment error rate is automatically displayed.

Confirm the error rate and if they are correct, do the next adjustment.

5-1-5. DVCPRO Recording Adjustment

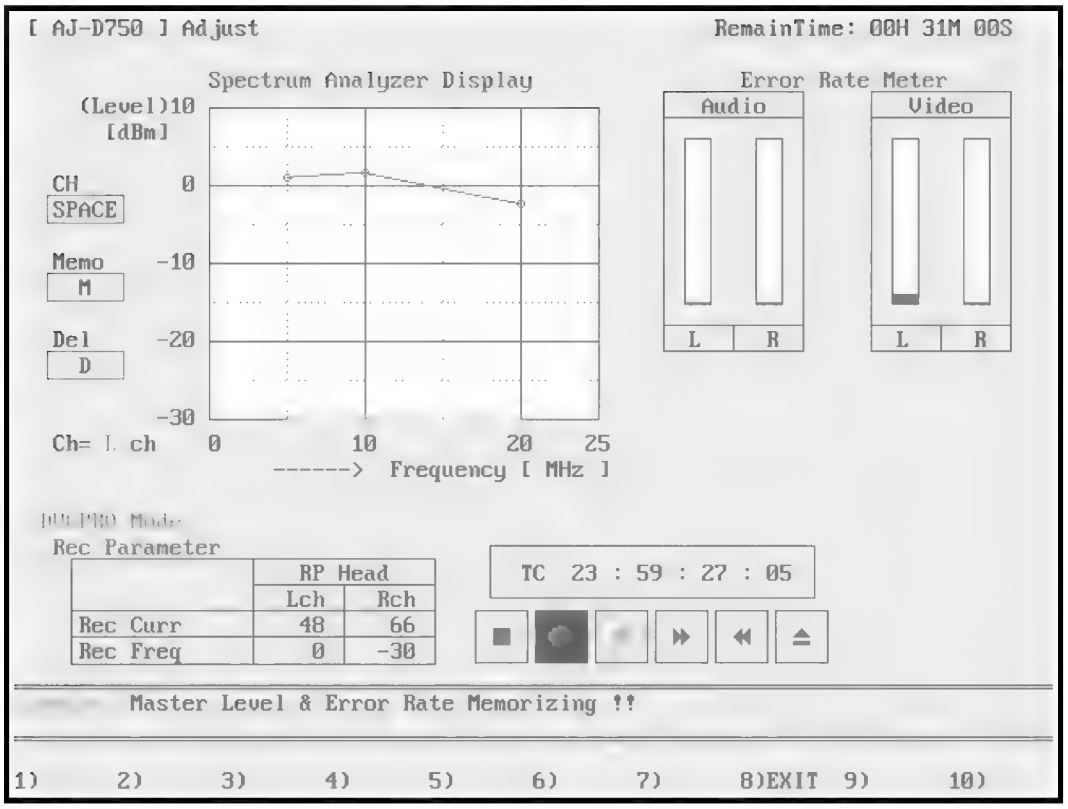
Start the DVCPRO Recording Adjustment after Playback Adjustment and Error Rate Confirmation.

1. Return to Main Menu. Press Enter key on the Error Rate Display Menu and open the Sub menu.
2. Select “6. Return to manual” and press F1 key (MAIN) and return to Main Menu.
3. Select “2. REC Adjustment” and following “REC Adjustment “ menu is appeared.



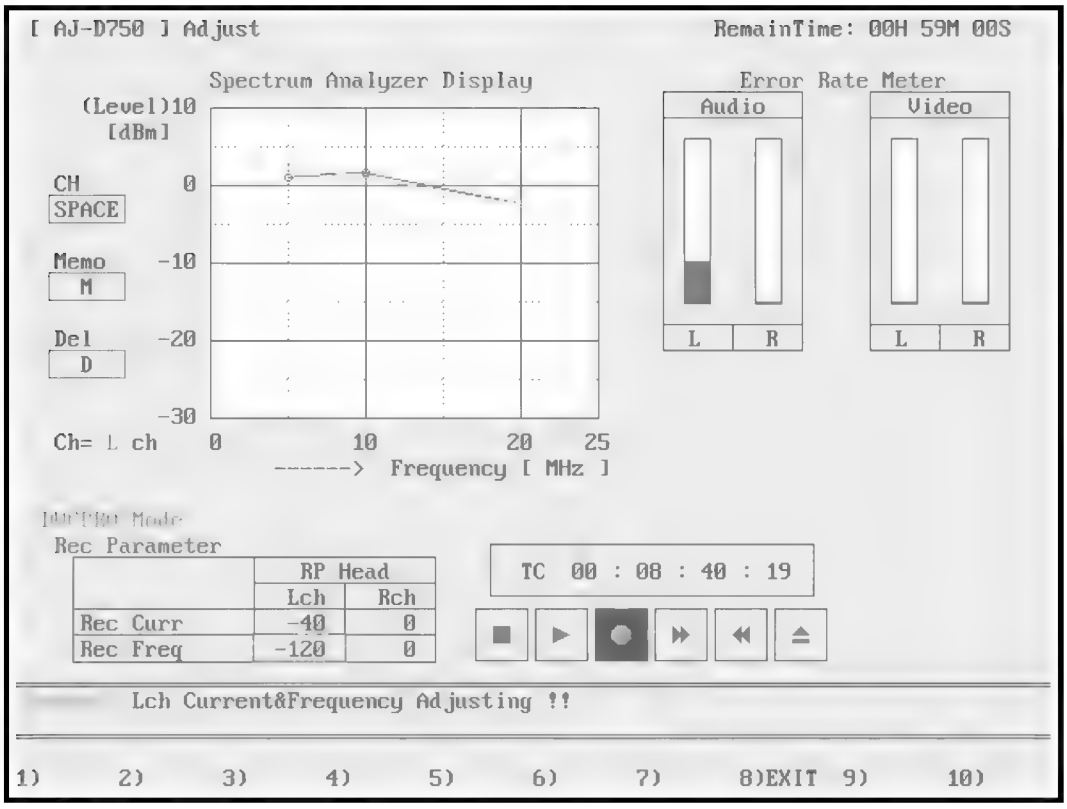
4. Tape not loading message is appeared. For the automatic adjustment press F8 key (AUTO).
5. Select “1. Adjust start” in the Sub Menu.
6. The messaged of “Please Insert DVCPRO MASTER TAPE (COLOR BAR)” is appeared, and insert the DVCPRO color bar master tape. After inserting the master tape, Master level and error rate level are automatically memorized.

7. During data memorizing, following menu is appeared and waveform is appeared in the Spectrum Analyzer Display part.



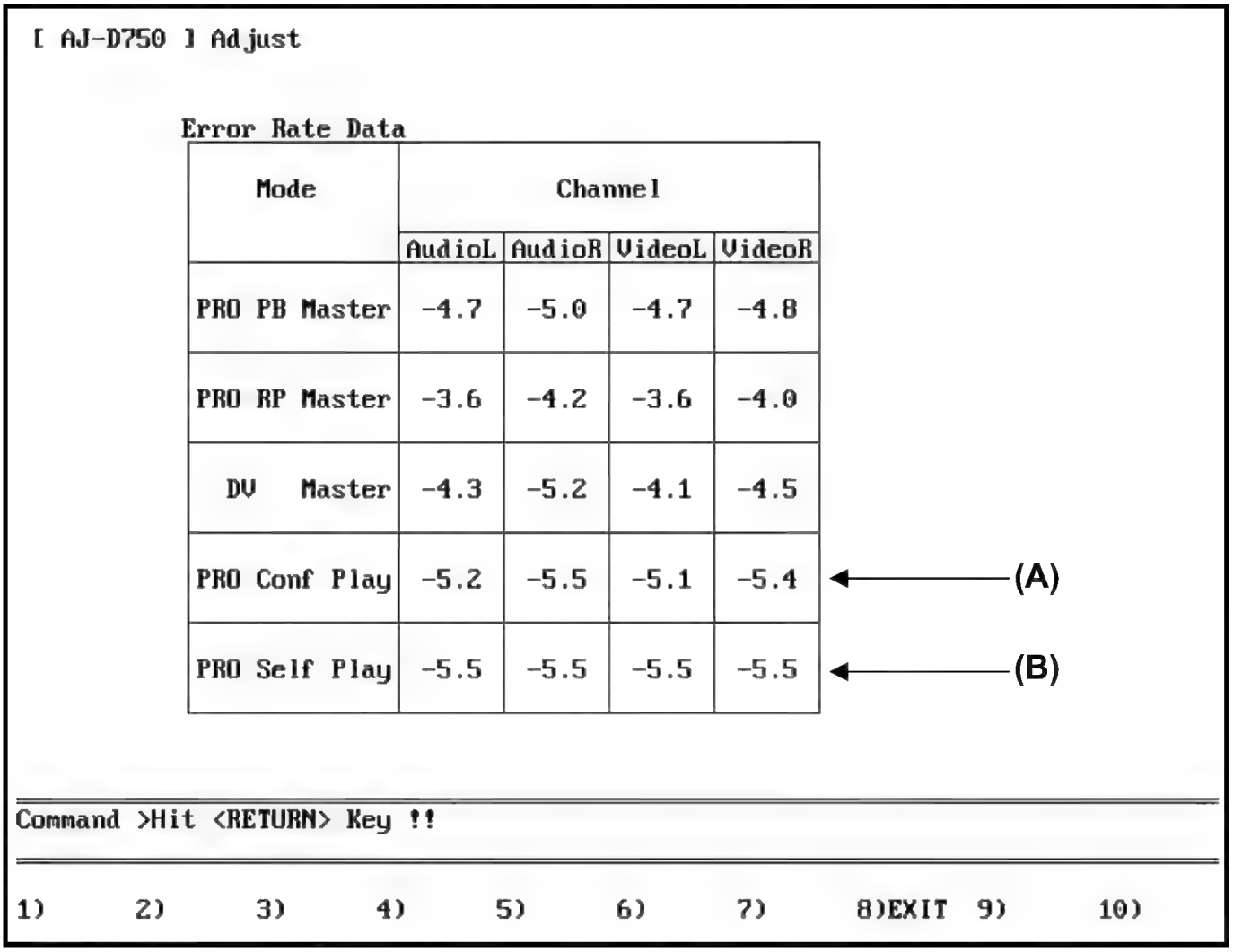
8. Tape is ejected after completion of Master Tape Data Memorizing, and “Please Insert Blank Tape” message is appeared. Then insert self recording and playback tape.

9. Start the Automatic Adjustment.



5-1-6.Confirmation of Error Rate (REC)

1. After completion of Automatic Adjustment '<Return> to NEXT STEP" message is appeared, the press Return (ENTER) key.
2. "Please Adjust VC600 and VC601 Trimmer Volume and Minimize Error Rate !!" message is appeared. At this menu, observe the error rate at upper right part of the screen and if the error rate is too high (RED color display), adjust manually VC600 and VC601 on the RF AMP (H4) BOARD. If the error rate display changed to green, press Return (ENTER) key.
3. Automatically goes to Error Rate measurement mode and "Error Rate Checking !!" message is displayed.
4. Error rate is displayed and completion of measurement.

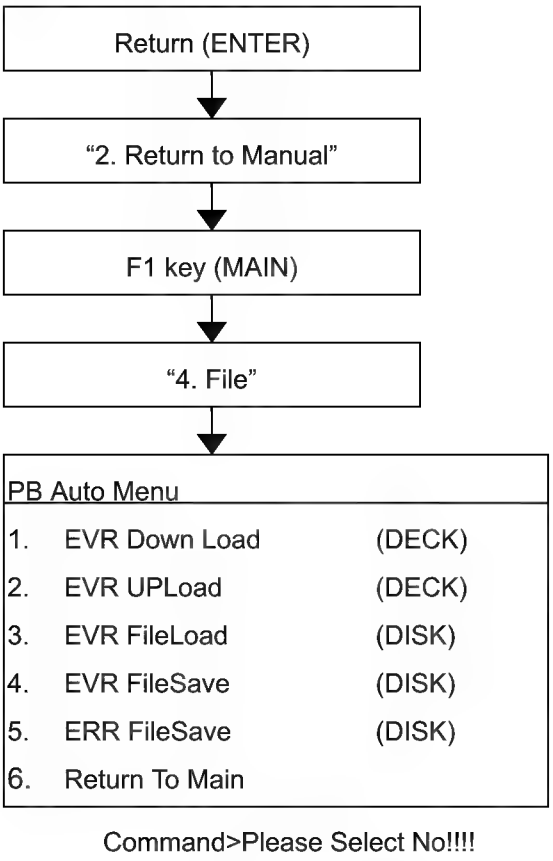


5. The row of (A) shows the error rate for confidence playback, the row of (B) shows the error rate for self recording and playback. Confirm the numbers are displayed in Green color.

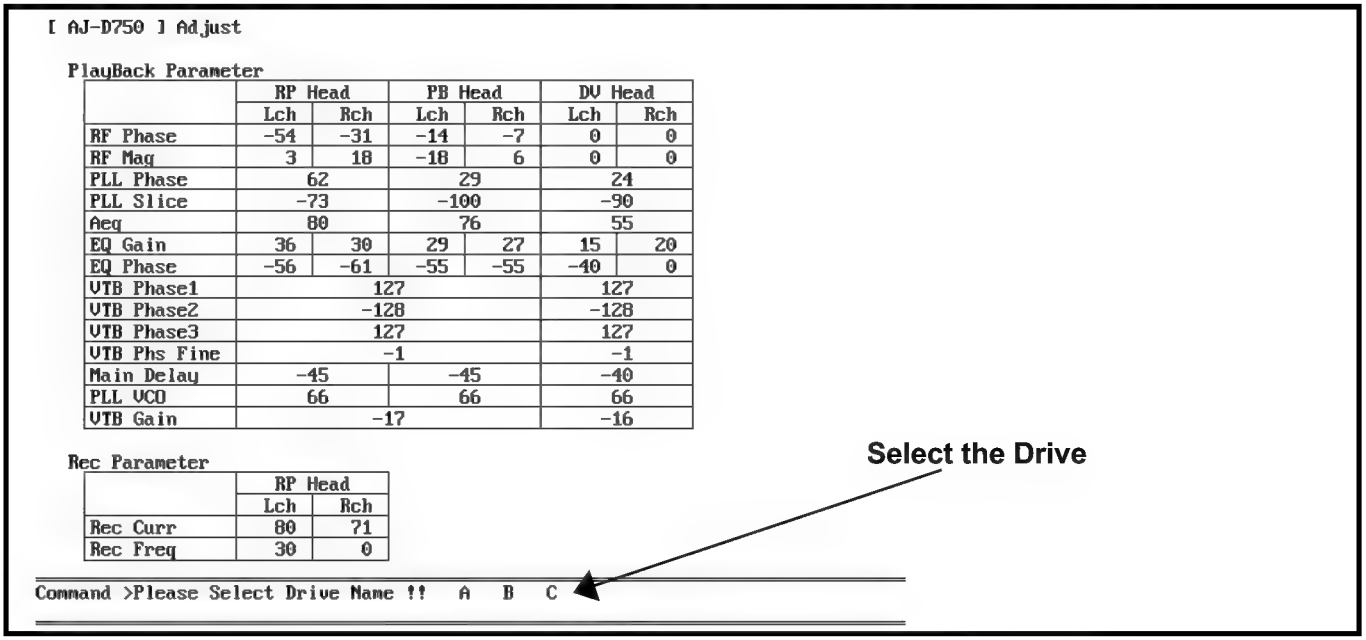
Save RF Data and Error Rate Data

RF Adjustment result data and error rate data can be saved.

1. Return to MAIN Menu from Recording Adjustment menu.
2. The procedures are show below.



3. item 3 is EVR data loading, item 4 is EVR data saving and item 5 is Error rate data saving.

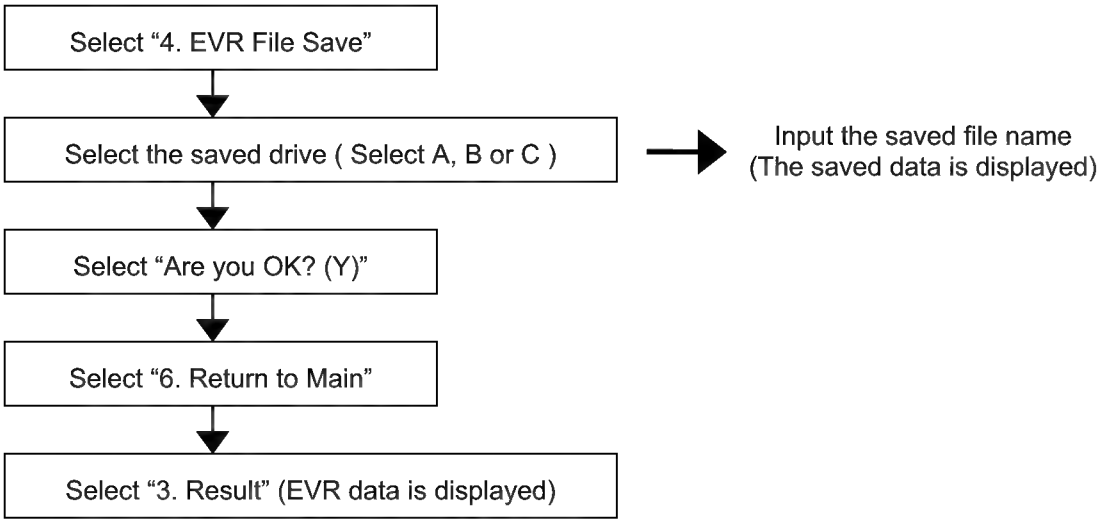

[AJ-D750] Adjust
PlayBack Parameter
RP Head PB Head DV Head
Lch Rch Lch Rch Lch Rch
RF Phase -54 -31 -14 -7 0 0
RF Mag 3 18 -18 6 0 0
PLL Phase 62 29 24
PLL Slice -73 -100 -90
Aeq 80 76 55
EQ Gain 36 30 29 27 15 20
EQ Phase -56 -61 -55 -55 -40 0
VTB Phase1 127 127
VTB Phase2 -128 -128
VTB Phase3 127 127
VTB Phs Fine -1 -1
Main Delay -45 -45 -40
PLL VCO 66 66 66
VTB Gain -17 -16
Rec Parameter
RP Head
Lch Rch
Rec Curr 80 71
Rec Freq 30 0
Select the Drive
Command >Please Select Drive Name !! A B C

<< EVR File Save >>

1. Select “4. EVR File Save”. All parameters are displayed and select the drive for data saving.
2. Enter the file name and comment after selecting the drive. File name must be in 8 characters, and comment is must be in 20 characters. The adjustment data for VTR can be managed same as linearity data. After enter the File name and comment, Sub-menu is automatically displayed. Then save the EVR data.

<< EVR File Load >>

1. Select “3. EVR File Load (DISK) for reading the EVR data from PC.
2. Select the drive follow the screen message input the saved filename, then EVR data displayed on the screen.
3. When escape from this EVR data display, press “ Y ” key follow the message “ Are You OK “ , then return to Sub-menu (File selected menu)


Select “4. EVR File Save”
Select the saved drive (Select A, B or C)
Input the saved file name
(The saved data is displayed)
Select “Are you OK? (Y)”
Select “6. Return to Main”
Select “3. Result” (EVR data is displayed)

<< Save the Error Data >>

1. Displayed PB Auto Menu as the same as step of introduction << Save and Reading the EVR Data >>.
2. Select “ 5. ERR File Save “ on the PB Auto menu.
3. The Error rate data is saved to same directly as AUTO EQ software, which is file “ ERRDATA.DAT “ Therefore it file can only entry the comment.
4. After input comment, Auto EQ software is executed saving operation and return to PB Auto menu.

<< Load the Error Data >>

1. The saved Error data file read on the Editor after return to Dos mode.
2. The contents of Error data file, which display from left side on the screen " date of saving(month/day/year),comment and error data." .
3. Order to display of Error data from left side, which display as numerical value of upper left(PRO PB MASTER – Audio L) on the error rate table of Auto EQ software display and next to right numerical value displayed. And next row of numerical value(PRO RP MASTER – Audio L) displayed from left to right direction. Therefore most of right side of numerical value on Editor display, which is numerical value of "PRO Self Play – Video R" .

<< EVR Up Load >>

When EVR file data load to VTR from PC. First EVR file load have to executed follow the procedure on previous page.

1. Select the item "2 EVR UP Load" and press "U" Key follow the message " (D)efault or (U)ser Data Up Load " .
2. After press "U" button appear the message "Up Load Complete !! Are You OK? [(Y)es or (N)o], then press (Y) button for up load EVR data to VTR.

<< EVR Down Load >>

Note: The EVR data keep on EQ software until escape DOS mode after Auto EQ adjustment finished. Therefore if you want to save EVR data without execute Auto EQ adjustment, necessary EVR Down Load operation.

1. Select the item " 2.EVR Down Load " and press "U" Key follow the message " (D)efault or (U)ser Down Load " .
2. After press "U" button appear the message "Down Load Complete !! Are You OK? [(Y)es or (N)o], then press (Y) button for EVR data down load to PC from VTR.

After finish EVR Down Load, perform " EVR File Save " for file save to disk drive follow the follow the procedure on previous page.

5-2. MANUAL ADJUSTMENT PROCEDURE

RF ADJUSTMENT

5-2-1. Pre EQ Adjustment

BOARD	RF AMP board (H4)
SPEC.	2.5VDC±0.2V(DVCPRO) 2.0+0.5V(DV)
TEST	TP20, TP18,TP1 and TP2 (Trigger)
ADJUST	C09:RP MAG L, C10:RP MAG R, C13:PB MAG L, C14:PB MAG R (EVR on RF ADJUST menu)
MODE	PLAY
TAPE	DV Alignment tape (NTSC: VFM3010EDS, PAL: VFM3110EDS) DVCPRO Alignment tape (NTSC: VFM3580KM, PAL: VFM3680KM)
M.EQ	Oscilloscope Monitor TV (Connect to VIDEO 3 OUT)

1. Open the RF ADJUST menu on the Service Menu.
2. Connect the Scope to TP1 for trigger.
3. Connect the Scope to TP20 and connect the ground to TG9.
4. Playback a color bar portion of the DV Alignment Tape.
5. Adjust EVR "C09:RP MAG L" and "C10:RP MAG R" so that the DC voltage is become 2.0V+0.5V.
6. Playback a color bar portion of DVCPRO Alignment Tape.
7. Adjust EVR "C09:RP MAG L" and "C10:RP MAG R" so that the DC voltage is become 2.5V+0.5V.
8. Connect the scope to TP18 and connect the ground to TG9.
9. Connect the scope to TP2 for trigger.
10. Adjust EVR "C13:PB MAG L" and EVR "C14:PB MAG R" so that the DC voltage is become 2.0V+0.5V.

Note: How to adjust the EVR.

(1) Press the MENU button on the front bottom panel, then " SET UP Menu " appeared on the screen.
(2) Keep holding press EJECT and STOP button, press the MENU button on the front bottom panel, then " Service Menu " appeared on the screen.
(3) Select the item " C00: RF ADJUST " by ▲ or ▼ button and press the SET button on the front bottom panel, then open " RF ADJUST " menu.
(4) Select the adjustment item by Cursor button, then move the start mark "✳" to the adjusting item.
(5) Adjust EVR by press ◀ or ▶ button, then adjustment value is changeable.

5-2-2. RF AMP PB Phase Adjustment

BOARD	RF AMP board (H4)
SPEC.	Minimum of Error Rate
TEST	Front Display
ADJUST	C07:RP PHASE L, C08:RP PHASE R C11:PB PHASE L, C12:PB PHASE R (EVR on RF ADJUST menu)
MODE	PLAY
TAPE	DV Alignment tape (NTSC: VFM3010EDS, PAL: VFM3110EDS) DVCPRO Alignment tape (NTSC: VFM3580KM, PAL: VFM3680KM)
M.EQ	Monitor TV (Connect to VIDEO 3 OUT)

1. Open the RF Adjust menu on the Service menu and set as follows.

C20	ERROR MODE	FAST
C19	PB MODE	RP H
C18	VITERBI MODE	ON
C17	CONCEAL MODE	OFF
C16	ECC MODE	AL OFF

2. Confirm that the Audio level meter is became video error display mode.
3. Playback the DV color bar portion of Alignment Tape.
4. Adjust EVR "C07: RP PHASE L" and "C08:RP PHASE R" so that the error rate is minimum.
5. Playback the color bar portion of DVCPRO Alignment tape.
6. Adjust EVR "C07:RP PHASE L" and "C08:RP PHASE R" so that the error rate is minimum.
7. Set the item "C19:PB MODE" to PB H.
8. Adjust "C11:PB PHASE L" and "C12:PB PHASE R" so that the error rate is minimum.

5-3. EQ ADJUSTMENT

5-3-1. PLL Lock Adjustment (PB)

BOARD	EQ Board (H3)
SPEC.	----------
TEST	TP403, Monitor
ADJUST	VR410, B01:PB PLL PHASE, B02:PB PLL SLICE (EVR on EQ ADJUST menu)
INPUT	----------
MODE	PLAY
TAPE	NTSC: VFM3580KM PAL: VFM3680KM
M.EQ	Monitor TV Oscilloscope

1. Set the Error Rate display mode.
2. Open the EQ ADJUST menu on Service Menu and set as follows.

B28	ERROR MODE	FAST
B27	PB MODE	PB H
B26	VITERBI MODE	OFF
B25	CONCEAL MODE	OFF
B24	ECC MODE	AL OFF

3. Playback the Alignment tape and confirm the picture is appeared on the monitor.
4. If picture is not appeared, adjust following items
   (1) Connect the scope to TP403 and adjust VR410 so that the DC voltage is become 2.1VDC.
   (2) Adjust "B01:PB PLL PHASE" and "B02:PB PLL SLICE" so that the picture appears on the monitor.
5. Repeat STOP to PLAY mode, and confirm the Picture is surely appeared every time.

5-3-2. PLL Latch Phase Coarse Adjustment (PB)

BOARD	EQ Board (H3)
SPEC.	Error Rate Minimum
TEST	Error Rate Level Meter (Front display)
ADJUST	B01:PB PLL PHASE (EVR on EQ ADJUST menu)
INPUT	----------
MODE	PLAY
TAPE	NTSC: VFM3580KM PAL: VFM3680KM
M.EQ	Monitor TV

1. Set the Error Rate display mode.
2. Open the EQ ADJUST menu on Service menu and set as follows.

B28	ERROR MODE	FAST
B27	PB MODE	PB H
B26	VITERBI MODE	OFF
B25	CONCEAL MODE	OFF
B24	ECC MODE	AL OFF

3. Playback the Alignment tape.
4. Adjust "B01:PB PLL PHASE" so that the video error rate becomes minimum.

5-3-3. PLL Slice Level Coarse Adjustment (PB)

BOARD	EQ Board (H3)
SPEC.	Error Rate Minimum
TEST	Error Rate Level Meter (Front display)
ADJUST	B02:PB PLL SLICE (EVR on EQ ADJUST menu)
INPUT	----------
MODE	PLAY
TAPE	NTSC: VFM3580KM PAL: VFM3680KM
M.EQ	Monitor TV

1. Set the Error Rate display mode.
2. Open the EQ ADJUST menu on Service menu and set as follows.

B28	ERROR MODE	FAST
B27	PB MODE	PB H
B26	VITERBI MODE	OFF
B25	CONCEAL MODE	OFF
B24	ECC MODE	AL OFF

3. Playback the Alignment tape.
4. Adjust “B02:PB PLL SLICE” so that the video error rate becomes minimum.

5-3-4. EQ Adjustment (1) (PB)

BOARD	EQ Board (H3)
SPEC.	Error Rate Minimum
TEST	Error Rate Level Meter (Front display)
ADJUST	B19:PB MAIN DL (EVR on EQ ADJUST menu)
INPUT	----------
MODE	PLAY
TAPE	NTSC: VFM3580KM PAL: VFM3680KM
M.EQ	Monitor TV

1. Set the Error Rate display mode.
2. Open the EQ ADJUST menu on Service menu and set as follows.

B28	ERROR MODE	FAST
B27	PB MODE	PB H
B26	VITERBI MODE	OFF
B25	CONCEAL MODE	OFF
B24	ECC MODE	AL OFF

3. Playback the Alignment tape.
4. Adjust “B19:PB MAIN DL” so that the video error rate is minimum.

5-3-5. EQ Adjustment (2) (PB)

BOARD	EQ Board (H3)
SPEC.	Error Rate Minimum
TEST	Error Rate Level Meter (Front display)
ADJUST	B03:PB AEQ, B04:PB GAIN L, B05:PB PHASE L, B06:PB GAIN R, B07:PB PHASE R (EVR on EQ ADJUST menu)
INPUT	----------
MODE	PLAY
TAPE	NTSC: VFM3580KM PAL: VFM3680KM
M.EQ	Monitor TV

1. Set the Error Rate display mode.
2. Open the EQ ADJUST menu on Service menu and set as follows.

B28	ERROR MODE	FAST
B27	PB MODE	PB H
B26	VITERBI MODE	OFF
B25	CONCEAL MODE	OFF
B24	ECC MODE	AL OFF

3. Playback the Alignment tape.
4. Adjust each adjustment item so that the each portions error rate becomes minimum as shown in the table.

Procedures	Adjust VR	Error Rate Portion
1	PB AEQ	VIDEO R & L CH
2	PB GAIN L	VIDEO L CH
3	PB PHASE L	VIDEO L CH
4	PB GAIN R	VIDEO R CH
5	PB PHASE R	VIDEO R CH

5-3-6. PLL Latch Phase Fine Adjustment (PB)

BOARD	EQ Board (H3)
SPEC.	Error Rate Minimum
TEST	Error Rate Level Meter (Front display)
ADJUST	B01:PB PLL PHASE (EVR on EQ ADJUST menu)
INPUT	----------
MODE	PLAY
TAPE	NTSC: VFM3580KM PAL: VFM3680KM
M.EQ	Monitor TV

1. Set the Error Rate display mode.
2. Open the EQ ADJUST menu on Service menu and set as follows.

B28	ERROR MODE	FAST
B27	PB MODE	PB H
B26	VITERBI MODE	OFF
B25	CONCEAL MODE	OFF
B24	ECC MODE	AL OFF

3. Playback the Alignment tape.
4. Adjust "B01:PB PLL PHASE" so that the video error rate becomes minimum.

5-3-7. PLL Slice Level Fine Adjustment (PB)

BOARD	EQ Board (H3)
SPEC.	Error Rate Minimum
TEST	Error Rate Level Meter (Front display)
ADJUST	B02:PB PLL SLICE (EVR on EQ ADJUST menu)
INPUT	----------
MODE	PLAY
TAPE	NTSC: VFM3580KM PAL: VFM3680KM
M.EQ	Monitor TV

1. Set the Error Rate display mode.
2. Open the EQ ADJUST menu on Service menu and set as follows.

B28	ERROR MODE	FAST
B27	PB MODE	PB H
B26	VITERBI MODE	OFF
B25	CONCEAL MODE	OFF
B24	ECC MODE	AL OFF

3. Playback the Alignment tape.
4. Adjust "B02:PB PLL SLICE" so that the video error rate becomes minimum.

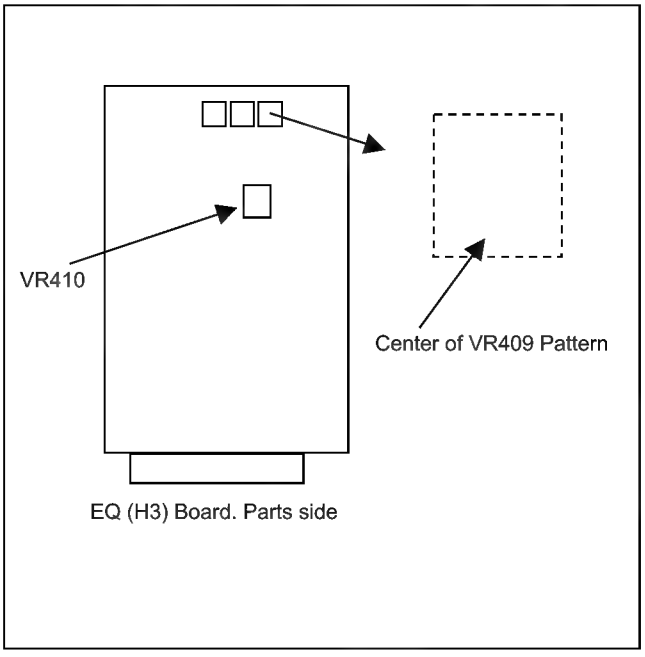
5-3-8. Viterbi A/D Input Level Adjustment

BOARD	EQ Board (H3)
SPEC.	Error Rate Minimum
TEST	Center of VR409 pattern Error Rate Level Meter (Front display)
ADJUST	B23:VITABI GAIN, VR801, (EVR on EQ ADJUST menu)
INPUT	----------
MODE	PLAY
TAPE	NTSC: VFM3580KM PAL: VFM3680KM
M.EQ	Monitor TV

1. Set the Error Rate display mode.
2. Open the EQ ADJUST menu on Service menu and set as follows.

B28	ERROR MODE	FAST
B27	PB MODE	PB H
B26	VITERBI MODE	ON
B25	CONCEAL MODE	OFF
B24	ECC MODE	AL OFF

3. Playback the Alignment tape.
4. Adjust "B23:VTB GAIN" so that the video error rate becomes minimum.
5. Connect the Electric Volt Meter to " Center of VR409 Pattern " as shown as below figure and confirm the DC voltage is 2.1V DC to 2.4VDC. If it is not, adjust VR801.



5-3-9. PLL Lock Adjustment (R/P)

BOARD	EQ Board (H3)
SPEC.	----------
TEST	TP203, Monitor TV
ADJUST	VR210, B08:RP PLL PHASE, B09:RP PLL SLICE (EVR on EQ ADJUST menu)
INPUT	----------
MODE	PLAY
TAPE	NTSC: VFM3580KM PAL: VFM3680KM
M.EQ	Monitor TV

1. Set the Error Rate display mode.
2. Open the EQ ADJUST menu on Service menu and set as follows.

B28	ERROR MODE	FAST
B27	PB MODE	RP H
B26	VITERBI MODE	OFF
B25	CONCEAL MODE	OFF
B24	ECC MODE	AL OFF

3. Playback the Alignment tape and confirm the picture appears on the monitor.
4. If the picture is not appeared adjust following items.
   (1) Connect the Electric Volt Meter to TP203 and adjust VR210 so that the DC voltage is 2.1VDC.
   (2) Adjust "B08:RP PLL PHASE" and "B09:RP PLL SLICE so that the picture appears on the monitor.
5. Repeat STOP to PLAY and confirm the picture is surely appeared.

5-3-10. PLL Latch Phase Adjustment (R/P)

BOARD	EQ Board (H3)
SPEC.	Error Rate minimum
TEST	Error Rate Level Meter (Front display)
ADJUST	B08:RP PLL PHASE (EVR on EQ ADJUST menu)
INPUT	----------
MODE	PLAY
TAPE	NTSC: VFM3580KM PAL: VFM3680KM
M.EQ	Monitor TV

1. Set the Error Rate display mode.
2. Open the EQ ADJUST menu on Service menu and set as follows.

B28	ERROR MODE	FAST
B27	PB MODE	RP H
B26	VITERBI MODE	OFF
B25	CONCEAL MODE	OFF
B24	ECC MODE	AL OFF

3. Playback the Alignment tape.
4. Adjust "B08:RP PLL PHASE" so that the video error rare is minimum.

5-3-11. PLL Slice Level Adjustment (R/P)

BOARD	EQ Board (H3)
SPEC.	Error Rate minimum
TEST	Error Rate Level Meter (Front display)
ADJUST	B09:RP PLL SLICE (EVR on EQ ADJUST menu)
INPUT	----------
MODE	PLAY
TAPE	NTSC: VFM3580KM PAL: VFM3680KM
M.EQ	Monitor TV

1. Set the Error Rate display mode.
2. Open the EQ ADJUST menu on Service menu and set as follows.

B28	ERROR MODE	FAST
B27	PB MODE	RP H
B26	VITERBI MODE	OFF
B25	CONCEAL MODE	OFF
B24	ECC MODE	AL OFF

3. Playback the Alignment tape.
4. Adjust “B09:RP PLL SLICE” so that the video error rare is minimum.

5-3-12. EQ Adjustment (1) (R/P)

BOARD	EQ Board (H3)
SPEC.	Error Rate minimum
TEST	Error Rate Level Meter (Front display)
ADJUST	B20:RP MAIN DL (EVR on EQ ADJUST menu)
INPUT	----------
MODE	PLAY
TAPE	NTSC: VFM3580KM PAL: VFM3680KM
M.EQ	Monitor TV

1. Set the Error Rate display mode.
2. Open the EQ ADJUST menu on Service menu and set as follows.

B28	ERROR MODE	FAST
B27	PB MODE	RP H
B26	VITERBI MODE	OFF
B25	CONCEAL MODE	OFF
B24	ECC MODE	AL OFF

3. Playback the Alignment tape.
4. Adjust “B20:RP MAIN DL” so that the video error rare is minimum.

5-3-13. EQ Adjustment (2) (R/P)

BOARD	EQ Board (H3)
SPEC.	Error Rate minimum
TEST	Error Rate Level Meter (Front display)
ADJUST	B10:RP AEQ, B11:RP GAIN L, B12:RP PHASE L, B13:RP GAIN R B14:RP PHASE R (EVR on EQ ADJUST menu)
INPUT	----------
MODE	PLAY
TAPE	NTSC: VFM3580KM PAL: VFM3680KM
M.EQ	Monitor TV

1. Set the Error Rate display mode on VTR.
2. Open the EQ ADJUST menu on Service menu and set as follows.

B28	ERROR MODE	FAST
B27	PB MODE	RP H
B26	VITERBI MODE	OFF
B25	CONCEAL MODE	OFF
B24	ECC MODE	AL OFF

3. Playback the Alignment tape.
4. Adjust the each EVR so that the error rate is minimum.

Procedures	Adjust VR	**Correspond of Error Rate Portion**
1	RP AEQ	VIDEO R & L CH
2	RP GAIN L	VIDEO L CH
3	RP PHASE L	VIDEO L CH
4	RP GAIN R	VIDEO R CH
5	RP PHASE R	VIDEO R CH

5-3-14.PLL Latch Phase Fine Adjustment (R/P)

BOARD	EQ Board (H3)
SPEC.	Error Rate minimum
TEST	Error Rate Level Meter (Front display)
ADJUST	B08:RP PLL PHASE (EVR on EQ ADJUST menu)
INPUT	----------
MODE	PLAY
TAPE	NTSC: VFM3580KM PAL: VFM3680KM
M.EQ	Monitor TV

1. Set the Error Rate display mode on VTR.
2. Open the EQ ADJUST menu on Service menu and set as follows.

B28	ERROR MODE	FAST
B27	PB MODE	RP H
B26	VITERBI MODE	OFF
B25	CONCEAL MODE	OFF
B24	ECC MODE	AL OFF

3. Playback the Alignment tape.
4. Adjust RP PLL PHASE so that the error rate is minimum.

5-3-15. PLL Slice Level Fine Adjustment (R/P)

BOARD	EQ Board (H3)
SPEC.	Error Rate minimum
TEST	Error Rate Level Meter (Front display)
ADJUST	B09:RP PLL SLICE (EVR on EQ ADJUST menu)
INPUT	----------
MODE	PLAY
TAPE	NTSC: VFM3580KM PAL: VFM3680KM
M.EQ	Monitor TV

1. Set the Error Rate display mode on VTR.
2. Open the EQ ADJUST menu on Service menu and set as follows.

B28	ERROR MODE	FAST
B27	PB MODE	RP H
B26	VITERBI MODE	OFF
B25	CONCEAL MODE	OFF
B24	ECC MODE	AL OFF

3. Playback the Alignment tape.
4. Adjust “B09:RP PLL SLICE” so that the error rate is minimum.

5-3-16. PLL Lock Confirmation (Consumer DV)

BOARD	EQ Board (H3)
SPEC.	----------
TEST	Monitor TV
ADJUST	B02:PB PLL SLICE (EVR on EQ ADJUST menu)
INPUT	----------
MODE	PLAY
TAPE	(Consumer DV Alignment Tape) NTSC:VFM3010EDS, PAL:VFM3110EDS
M.EQ	Monitor TV

1. Set the Error Rate display mode on VTR.
2. Open the EQ ADJUST menu on Service menu and set as follows.

B28	ERROR MODE	FAST
B27	PB MODE	RP H
B26	VITERBI MODE	OFF
B25	CONCEAL MODE	OFF
B24	ECC MODE	AL OFF

3. Playback the Alignment tape and confirm the picture appears on the monitor.
   If picture is not appeared adjust “B02:PB PLL SLICE.” so that the picture appears on the monitor.
4. Repeat STOP to PLAY and confirm the picture is surely appeared.

5-3-17. PLL Slice Level Coarse Adjustment (Consumer DV)

BOARD	EQ Board (H3)
SPEC.	Error Rate Minimum
TEST	Error Rate Level Meter (Front display)
ADJUST	B02:PB PLL SLICE (EVR on EQ ADJUST menu)
INPUT	----------
MODE	PLAY
TAPE	(Consumer DV Alignment Tape) NTSC:VFM3010EDS, PAL:VFM3110EDS
M.EQ	Monitor TV

1. Set the Error Rate display mode.
2. Open the EQ ADJUST menu on Service menu and set as follows.

B28	ERROR MODE	FAST
B27	PB MODE	RP H
B26	VITERBI MODE	OFF
B25	CONCEAL MODE	OFF
B24	ECC MODE	AL OFF

3. Playback the Alignment tape.
4. Adjust “B02:PB PLL SLICE”, so that the video error rate is minimum.

5-3-18. EQ Adjustment (1) (Consumer DV)

BOARD	EQ (H3)
SPEC.	Error Rate Minimum
TEST	Error Rate Level Meter (Front display)
ADJUST	B19:PB MAIN DL (EVR on EQ ADJUST menu)
INPUT	----------
MODE	PLAY
TAPE	(Consumer DV Alignment Tape) NTSC:VFM3010EDS, PAL:VFM3110EDS
M.EQ	Monitor TV

1. Set the Error Rate display mode.
2. Open the EQ ADJUST menu on Service menu and set as follows.

B28	ERROR MODE	FAST
B27	PB MODE	RP H
B26	VITERBI MODE	OFF
B25	CONCEAL MODE	OFF
B24	ECC MODE	AL OFF

3. Playback the Alignment tape.
4. Adjust “B19:PB MAIN DL” so that the video error rate is minimum.

5-3-19. EQ Adjustment (2) (Consumer DV)

BOARD	EQ Board (H3)
SPEC.	Error Rate Minimum
TEST	Error Rate Level Meter (Front display)
ADJUST	B03:PB AEQ, B04:PB GAIN L, B05:PB PHASE L, B06:PB GAIN R, B07:PB PHASE R (EVR on EQ ADJUST menu)
INPUT	----------
MODE	PLAY
TAPE	(Consumer DV Alignment Tape) NTSC:VFM3010EDS, PAL:VFM3110EDS
M.EQ	Monitor TV

1. Set the Error Rate display mode.
2. Open the EQ ADJUST menu on Service menu and set as follows.

B28	ERROR MODE	FAST
B27	PB MODE	RP H
B26	VITERBI MODE	OFF
B25	CONCEAL MODE	OFF
B24	ECC MODE	AL OFF

3. Playback the Alignment tape.
4. Adjust each EVR so that the error rate is minimum.

Procedures	Adjust VR	Correspond of Error Rate Portion
1	PB AEQ	VIDEO R & L CH
2	PB GAIN L	VIDEO L CH
3	PB PHASE L	VIDEO L CH
4	PB GAIN R	VIDEO R CH
5	PB PHASE R	VIDEO R CH

5-3-20. PLL Slice Level Fine Adjustment (Consumer DV)

BOARD	EQ Board (H3)
SPEC.	Error Rate Minimum
TEST	Error Rate Level Meter (Front display)
ADJUST	B08:PB PLL PHASE (EVR on EQ ADJUST menu)
INPUT	----------
MODE	PLAY
TAPE	(Consumer DV Alignment Tape) NTSC:VFM3010EDS, PAL:VFM3110EDS
M.EQ	Monitor TV

1. Set the Error Rate display mode.
2. Open the EQ ADJUST menu on Service menu and set as follows.

B28	ERROR MODE	FAST
B27	PB MODE	RP H
B26	VITERBI MODE	OFF
B25	CONCEAL MODE	OFF
B24	ECC MODE	AL OFF

3. Playback the Alignment tape.
4. Adjust “B08:PB PLL SLICE” so that the video error rate becomes minimum.

5-3-21. Consumer DV Viterbi Confirmation

BOARD	EQ Board (H3)
SPEC.	Error Rate Minimum
TEST	Error Rate Level Meter (Front display)
ADJUST	B23:VTB GAIN, B01:PB PLL PHASE (EVR on EQ ADJUST menu)
INPUT	----------
MODE	PLAY
TAPE	(Consumer DV Alignment Tape) NTSC:VFM3010EDS, PAL:VFM3110EDS
M.EQ	Monitor TV

1. Set the Error Rate display mode.
2. Open the EQ ADJUST menu on Service menu and set as follows.

B28	ERROR MODE	FAST
B27	PB MODE	PB H
B26	VITERBI MODE	OFF
B25	CONCEAL MODE	OFF
B24	ECC MODE	AL OFF

3. Playback the Alignment tape.
4. Confirm the error rate is improved by Viterbi on. The improvement can be confirmed by the error rate meter decrease 5 scale on the front audio meter.
5. If the error rate is not improved so much, adjust "B23:VTB GAIN" and "B01:PB PLL PHASE".

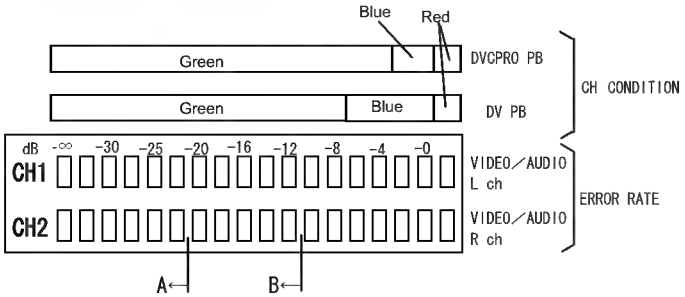
5-3-22.Final confirmation of Error Rate.

BOARD	EQ Board (H3)
SPEC.	DVCPRO (PB mode) : under the A
	DV (PB mode) : under the B
TEST	Error Rate Level Meter (Front display)
MODE	PLAY
TAPE	(DVCPRO Alignment Tape) NTSC: VFM3580KM, PAL: VFM3680KM (Consumer DV Alignment Tape) NTSC:VFM3110EDS, PAL:VFM3110EDS
M.EQ	Monitor TV

1. Set the Error Rate display mode
2. Open the EQ ADJUST menu on Service menu and set as follows.

ITEM of the MENU	DVCPRO	DV
B28: ERROR MODE	FAST	FAST
B27: PB MODE	PB H	RP H
B26: VITERBI MODE	ON	ON
B25: CONCEAL MODE	OFF	OFF
B24: ECC MODE	AL OFF	AL OFF

3. Set the Audio Channel indicator to "CH2" by pressing DIAG button (Video error is appeared on the Audio meter).
4. Confirm that the Error rate in specification, on DVCPRO playback and DV playback mode.



5-4. REC AMP Board

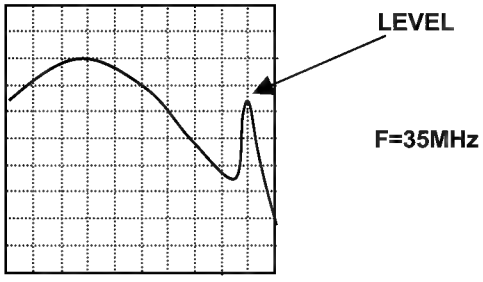
5-4-1. REC Current, Frequency Characteristic Adjustment

BOARD	RF AMP (H4)
SPEC.	----------
TEST	TP17,TG7 (GND), TP2 (TRIG)
ADJUST	C01:REC CURR L, C03:REC CUR R C02:REC FREQ L, C04:REC FREQ R (EVR on RF ADJUST menu) VC600,VC601
INPUT	100% Colour bar
MODE	PLAY, REC / PLAY
TAPE	NTSC: VFM3580KM, PAL: VFM3680KM Blank Tape
M.EQ	Spectrum Analyzer / Monitor TV (Connect to VIDEO 3 OUT)

1. Connect the trigger of spectrum Analyzer at TP2 and connect the Spectrum Analyzer in at TP17 with 50ohm coaxial cable (Use GND at TG7).
2. Set the Error Rate display mode.
3. Open the RF ADJUST menu on Service menu and set as follows.

C20	ERROR MODE	FAST
C19	PB MODE	PB H
C18	VITERBI MODE	ON
C17	CONCEAL MODE	OFF
C16	ECC MODE	AL OFF

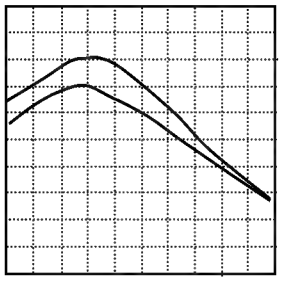
4. Playback the Alignment tape and Store the waveform on the spectrum Analyzer in TRACE-A.
5. Eject the Alignment tape and insert a Blank tape and record a colour bar 100% signal.



6. Set the TRACE-B mode on Spectrum Analyzer and Adjust VC600 and VC601 so that the peak level of 35MHz portion is minimum.
7. Adjust "C01:REC CUR L" and "C03:REC CUR R" so that the level of 5MHz portion is become –4dB±0.5dB per the waveform of TRACE-A.
8. Adjust "C02:REC FREQ L" and "C04:REC FREQ R" so that the level at 20MHz portion is become maximum.

POINT: Set the confidence playback level is lower less than level of TRACE-A and increase the gain gradually by Search Dial so that the level is maximum.
Please set the adjustment value in the first place the level is become maximum.

9. Confirm that the error rate is less than –12dB digit on the level meter.(Refer to item 5-3-22)
10. If the level of TRACE-B is not same as TRACE-A, confirm that the level of TRACE-B is within 0 to –2dB against TRASE-A (spec: 0 to –2dB).
11. Record for one minute keeping the above condition. Then playback the just recorded potion and confirm the error rate is same or better than DVCPRO playback (Refer to item 5-3-22 : equivalent level of DVCPRO Alignment tape playback).



■ ITEM PARAMETER

REF. LEVEL	-25dB
ATT	10dB
DIV	5dB/DIV
START FREQUENCY	0KHz
STOP FREQUENCY	40MHz
RES VW	1MHz
VBW	3KHz
SWEEP	300msec
TRIGGER	EXT (HEAD SW)

5-4-2. Rotary Erase Current Adjustment

BOARD	RF AMP (H4)
SPEC.	1.0 ± 0.12V
TEST	TP11, TP12
ADJUST	VR13, VR14
INPUT	100% Colour Bar
MODE	REC / PLAY
TAPE	Blank Tape
M.EQ	Oscilloscope

1. Insert a REC/PLAY tape auto record a 100% colour bar signal.
2. Connect a scope to TP11 with 10:1 probe and adjust VR 13 (RE A) so that the DC level is in the specification (1.0V ± 0.12V).
3. Then connect the scope to TP12 and adjust VR14 (RE B) so that the DC level is in the specification (1.0V ± 0.12V).

6. REC PB

6-1. PLL Lock DC Level Adjustment

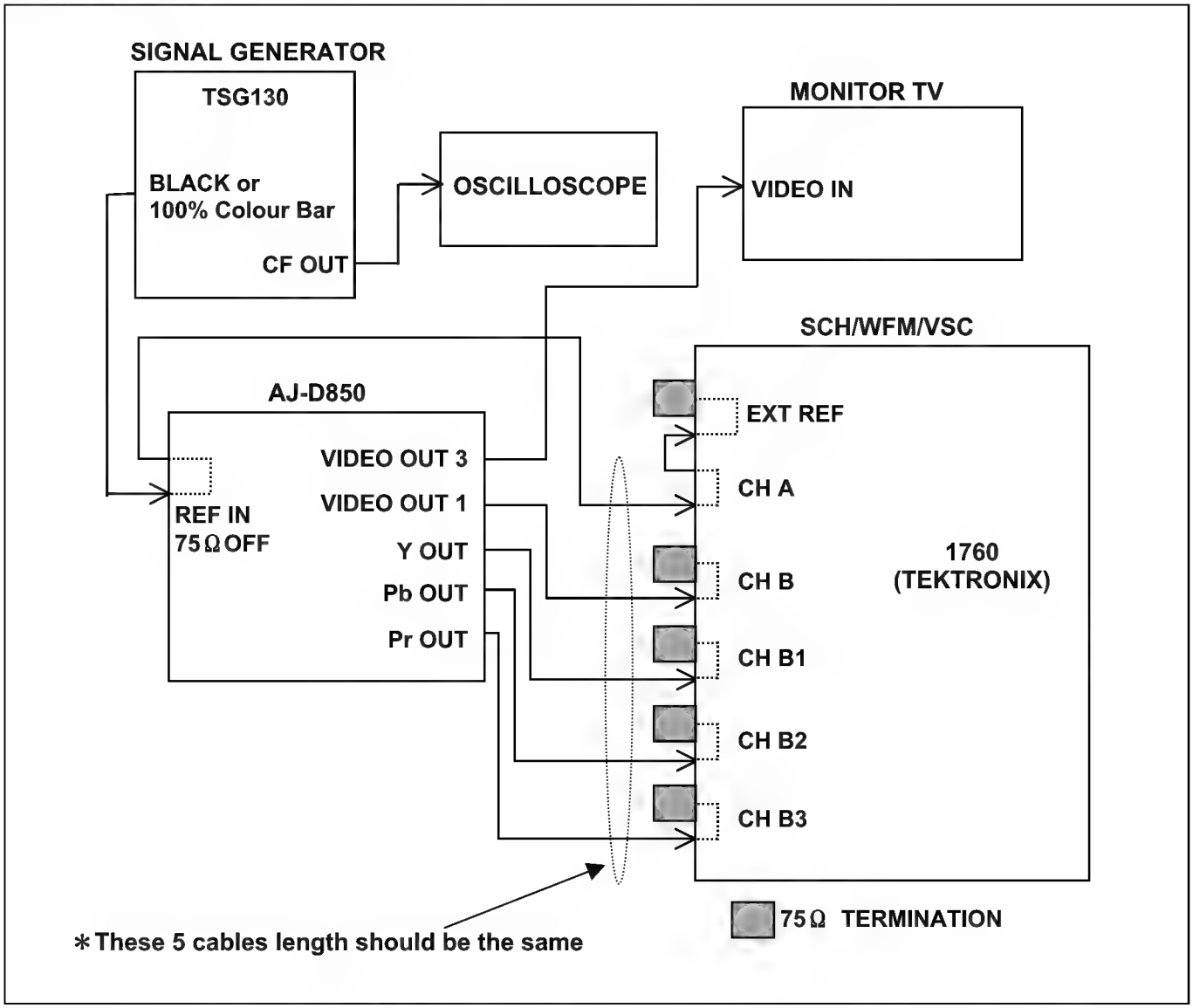
P.C.B.	REC PB (F5)
SPEC.	0.0V ± 0.2V
TEST	TP113
ADJ.	VC1
INPUT	----------
MODE	EE
TAPE	----------
M.EQ	Oscilloscope

1. Adjust VC170 so that the DC level is in specification.

7. Video Out P. C. Board (F4) [FOR NTSC ONLY]

Please warm up the VTR about 10 minute before adjustment.

CONNECTION



7-1. DA Reference Voltage Adjustment

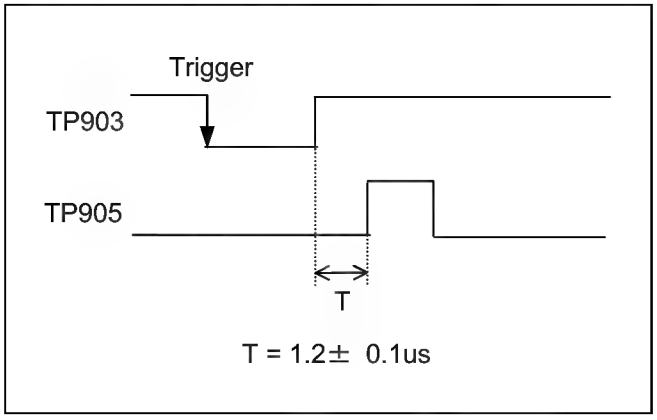
P.C.B.	V_OUT (F4)
SPEC.	3.9V± 0.05VDC
TEST	TP300 (H-3)
ADJ.	VR300 (G-1)
INPUT	REF IN: Composite 75% color bar
MODE	EE
TAPE	----------
M.EQ	Oscilloscope

Adjust VR300 so that the voltage is 3.9V± 0.05VDC.

7-2. Sampling Position Adjustment

P.C.B.	V_OUT (F4)
SPEC.	1.2± 0.1us
TEST	TP903 (D-1), TP905 (C-2)
ADJ.	VR900 (C-1)
INPUT	REF IN: Composite 75% color bar
MODE	EE
TAPE	----------
M.EQ	Oscilloscope

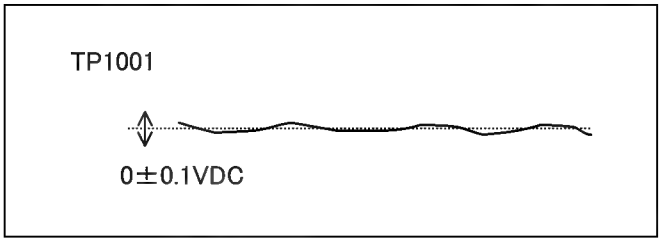
Adjust VR900 so that the phase difference is 1.2± 0.1us between the rising edge at TP903 and the rising edge at TP905 as shown in figure.



7-3. PLL Center Adjustment

P.C.B.	V_OUT (F4)
SPEC.	0V± 0.1VDC
TEST	TP1001 (D-1)
ADJ.	VC1000 (D-2)
INPUT	REF IN: Composite 75% color bar
MODE	EE
TAPE	----------
M.EQ	Oscilloscope

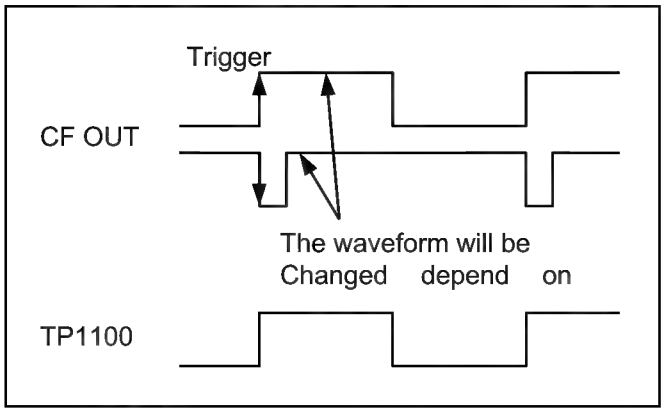
1. Adjust VC1000 so that the voltage is 0V ± 0.1VDC.



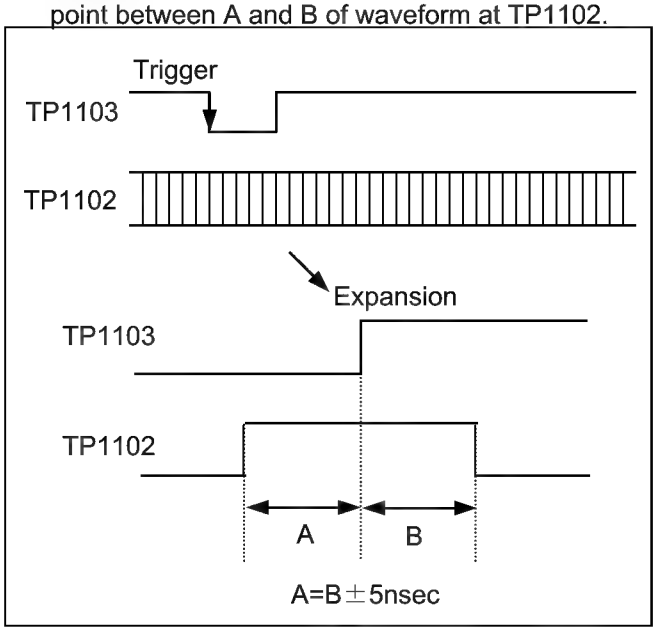
7-4. REF CF Detection Adjustment

P.C.B.	V_OUT (F4)
SPEC.	See Figure, A = B±5%
TEST	TP1100 (C-2), CF Out of Signal SG TP1102 (C-2), TP1103 (C-2)
ADJ.	VR901 (C-1)
INPUT	REF IN: Composite 75% Color Bar
MODE	EE
TAPE	----------
M.EQ	Oscilloscope

1. Connect the oscilloscope CH1 to the CF output of composite signal generator and CH2 to TP1100.
2. Adjust VR901 so that the phase is synchronized between CF pulses and TP1100 as shown in figure.



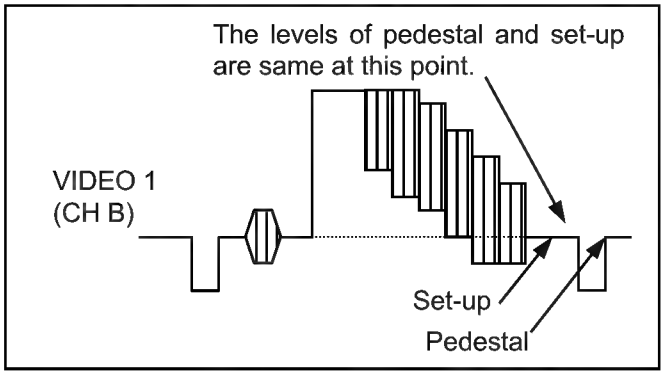
3. Connect the oscilloscope CH1 to TP1103 and CH2 to TP1102.
4. Expand (delay) the rising edge of TP1103.
5. Slowly and slightly rotate VR901 so that the rising edge of TP1103 is positioned at the center of cross point between A and B of waveform at TP1102.



7-5. Composite Set-up Adjustment

P.C.B.	V_OUT (F4)
SPEC.	Set-up Level = Pedestal Level±1RE
TEST	VIDEO OUT 1
ADJ.	VR802 (J-2)
INPUT	----------
MODE	PLAY
TAPE	VFM3580KM (75% Color Bar portion)
M.EQ	Waveform Monitor

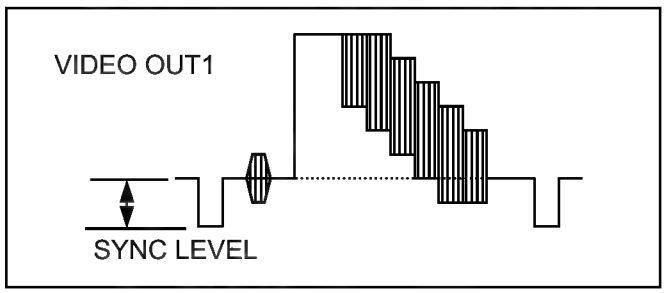
1. Open the VIDEO ADJUST menu on Service Menu and set item "D08: V SETUP" to ON.(Only AJ-D450)
2. Set the item "613:V IN SETUP" and "614:V OUT SETUP" to "THRU" on SET UP menu.(Only AJ-D450)
3. Adjust VR802 so that the set-up level is the same level as the pedestal level.



7-6. Sync Level Adjustment

P.C.B.	V_OUT (F4)
SPEC.	40IRE±1%
TEST	VIDEO OUT 1
ADJ.	VR400 (G-1)
INPUT	----------
MODE	PLAY
TAPE	VFM3580KM (75% Color Bar portion)
M.EQ	Waveform Monitor

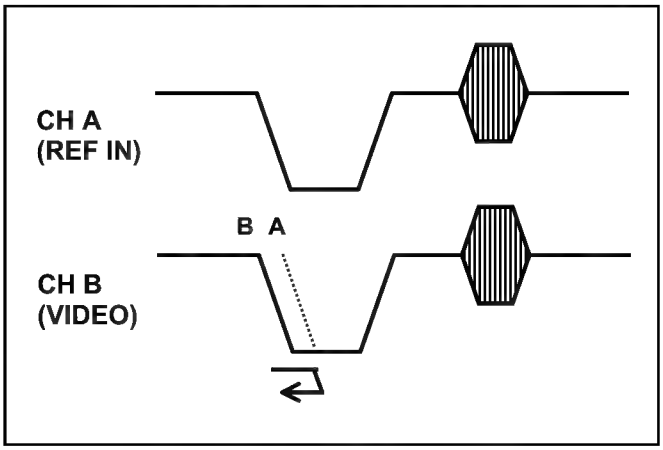
1. Adjust VR400 so that the Sync Level is 40IRE± 1%.



7-7. H Phase Adjustment

P.C.B.	V_OUT (F4)
SPEC.	Refer to below description
TEST	REF IN (CHA), VIDEO OUT 1 (CHB)
ADJ.	VR1100 (B-1)
INPUT	REF IN: Composite 75% Color Bar
MODE	PLAY
TAPE	VFM3580KM (75% Color Bar portion)
M.EQ	Waveform Monitor

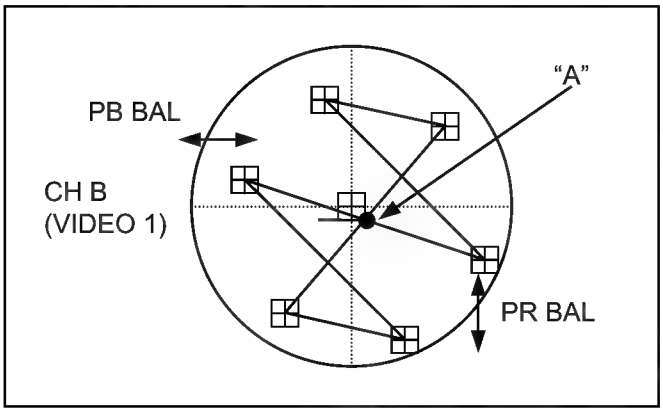
1. Set WFM in the EXT-REF MODE.
2. Adjust VR1100 so that the phase synchronized between REF IN (CHA) and VIDEO OUT 1 (CHB). Please follow the below indicated procedure.
   (1). Adjust VR1100 so that the H Phase of V OUT is at A Position.
   (2). After the item (1), adjust VR1100 so that the H Phase of V OUT is at A Position.



7-8. Carrier Balance Adjustment

P.C.B.	V_OUT (F4)
SPEC.	Cross point “A” at the center of scope.
TEST	VIDEO OUT 1
ADJ.	VR505 (I-1), VR506 (I-1)
INPUT	----------
MODE	PLAY
TAPE	VFM3580KM (75% Color Bar portion)
M.EQ	Vector Scope

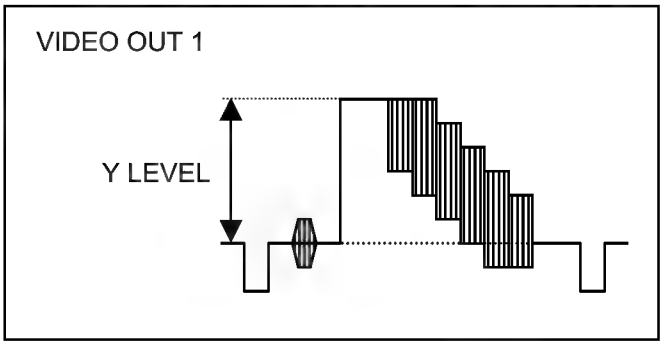
1. Adjust VR505 (PB BAL) and VR506 (PR BAL) so that the cross point “A” is positioned at the center of the vector scope.



7-9. Composite Y Level Adjustment

P.C.B.	V_OUT (F4)
SPEC.	100IRE±1%
TEST	VIDEO OUT 1
ADJ.	VR800 (I-1)
INPUT	----------
MODE	PLAY
TAPE	VFM3580KM (75% Color Bar portion)
M.EQ	Waveform Monitor

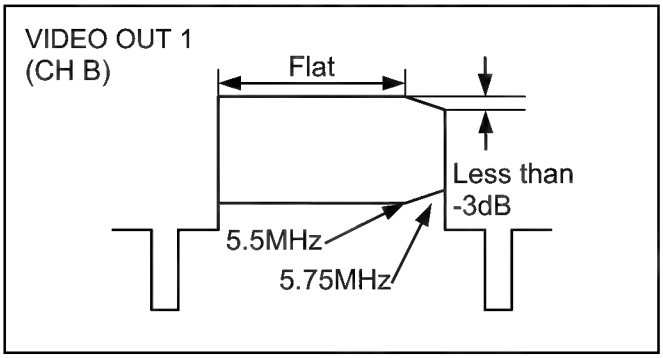
1. Adjust VR800 so that the Y level is 100IRE±1%.



7-10. Composite Y Frequency Response Adjustment

P.C.B.	V_OUT (F4)
SPEC.	5.5MHz = Less than –3dB
TEST	VIDEO OUT 1
ADJ.	VR801 (I-1)
INPUT	----------
MODE	PLAY
TAPE	VFM3580KM (H-Sweep portion)
M.EQ	Waveform Monitor

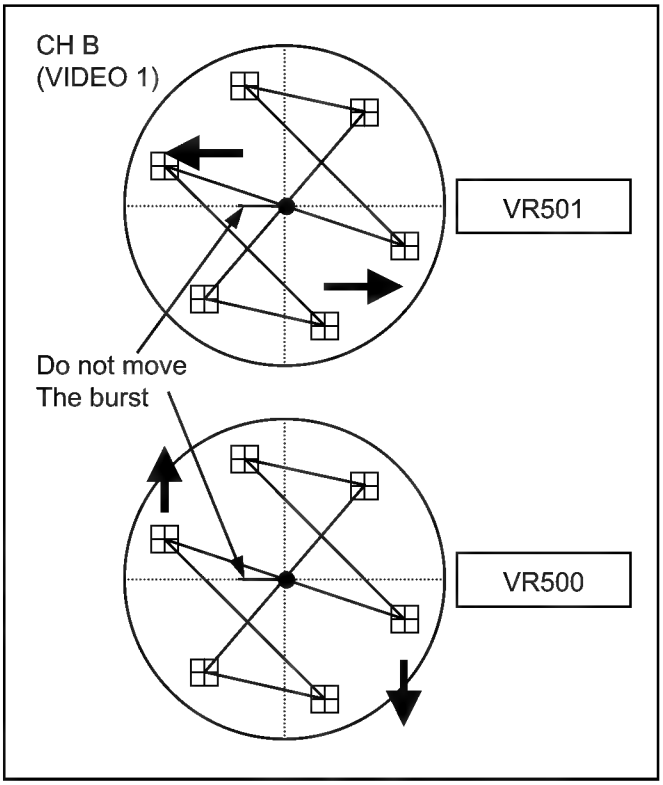
1. Adjust VR801 so that the frequency response becomes flat.
   a) The level of 5.5MHz portion is less than –3dB.
   b) The middle frequency is flat.

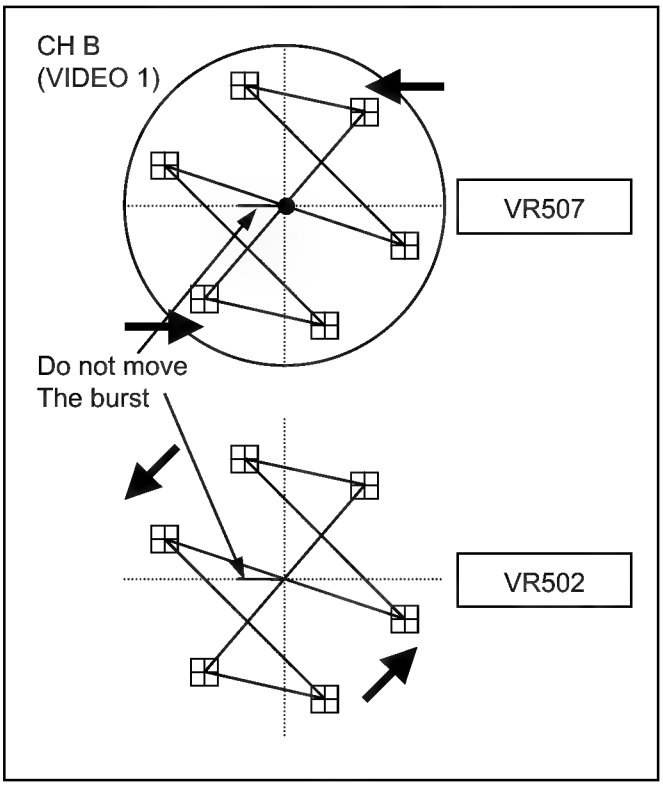


7-11. Vector Adjustment

P.C.B.	V_OUT (F4)
SPEC.	All vectors are in the Inner Boxes
TEST	VIDEO OUT 1
ADJ.	VR500 (H-1), VR502 (H-1) VR501 (H-1), VR507 (I-1)
INPUT	----------
MODE	PLAY
TAPE	VFM3580KM (75% Color Bar portion)
M.EQ	Vector Scope

1. Set the burst position on the Vector Scope at correct position.
2. Adjust the following VR's so that the color bar's each vector points are in the square mark on the vector scope.
   - VR507 : Quad Phase
   - VR502 : Hue Phase
   - VR501 : Encode PB Level
   - VR500 : Encode PR Level

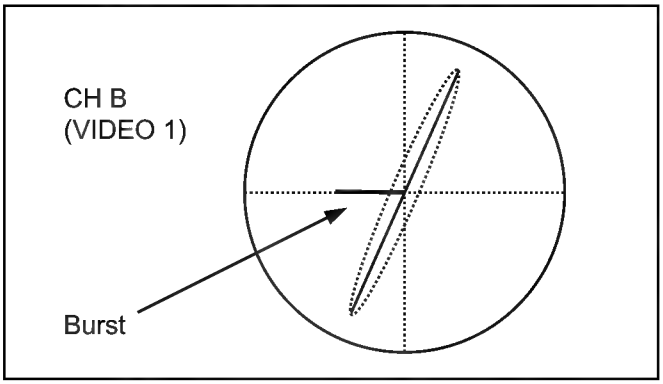




7-12. Composite Pb/Pr Timing Adjustment

P.C.B.	V_OUT (F4)
SPEC.	0±10nsec
TEST	VIDEO OUT 1
ADJ.	VR307 (F-1)
INPUT	----------
MODE	PLAY
TAPE	VFM3580KM (Bowtie portion)
M.EQ	Vector Scope

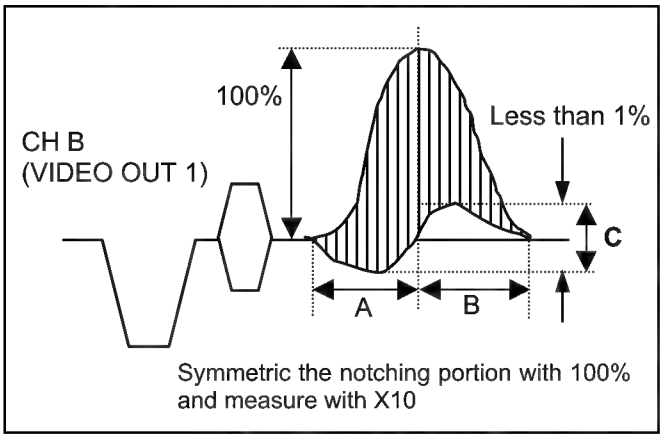
1. Adjust VR307 so that the signal on the vector scope becomes 1 straight lines (X) as shown in figure.



7-13. Composite Y/C Timing Adjustment

P.C.B.	V_OUT (F4)
SPEC.	0±10nsec (C = less than 1%)
TEST	VIDEO OUT 1
ADJ.	VR803 (I-1)
INPUT	----------
MODE	PLAY
TAPE	VFM3580KM (Pulse Bar portion)
M.EQ	Waveform Monitor

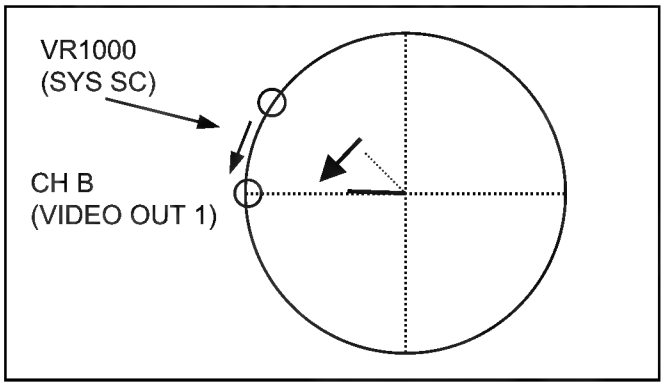
1. Adjust VR803 so that the portion A and B are become symmetric left and right and level of portion C less than 1% against level of waveform 100% as shown in figure.
2. When performing this adjustment, the level of waveform may be changed. Therefore, level of waveform is adjusted by Chroma VR on the front panel during this adjustment.
3. After finish this adjustment set the Chroma VR to preset position.
4. After completion of this adjustment, “7-14. Sub-Carrier Phase Adjustment” should be performed.



7-14. Sub-Carrier Phase Adjustment

P.C.B.	V_OUT (F4)
SPEC.	0±1degree
TEST	VIDEO OUT 1 (CHB), REF IN (CHA)
ADJ.	VR1000 (B-1)
INPUT	REF IN: Composite 75% Color Bar
MODE	PLAY
TAPE	VFM3580KM (75% Color Bar portion)
M.EQ	SCH Meter

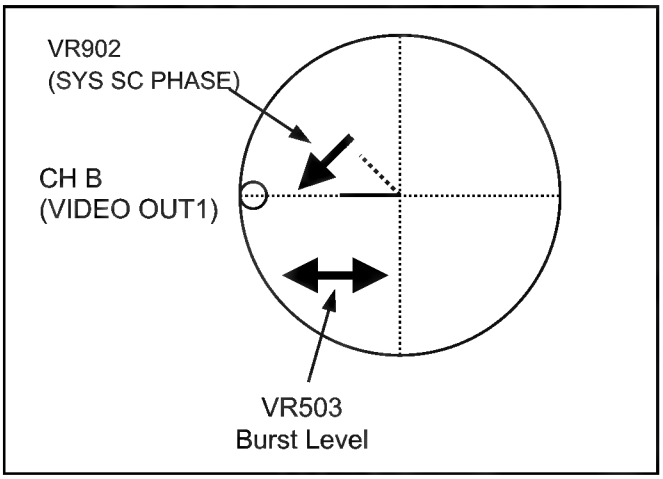
1. Adjust VR1000 so that the SCH of VIDEO OUT(CHB) is same as EXT-REF-IN(CHA), then SCH phase should be become 0±1 degree.

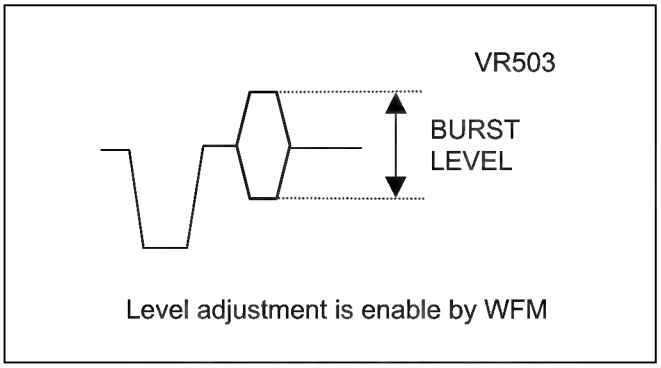


7-15. Burst Adjustment

P.C.B.	V_OUT (F4)
SPEC.	PHASE: 0±1degree LEVEL: 40±0.4IRE
TEST	VIDEO OUT 1
ADJ.	VR902 (B-1), VR503 (H-1)
INPUT	REF IN: Composite 75% Color Bar
MODE	PLAY
TAPE	VFM3580KM (75% Color Bar portion)
M.EQ	SCH Meter

1. Adjust VR902 while changing the channels A and B of the SCH meter alternately so that the SCH is 0 degree.
2. Adjust VR503 while changing the channels A and B of the SCH meter alternately so that the burst level and burst phase are become same between VIDEO 1 OUT(CHB) and REF(CHA),then burst level is should be become 40±0.4IRE.

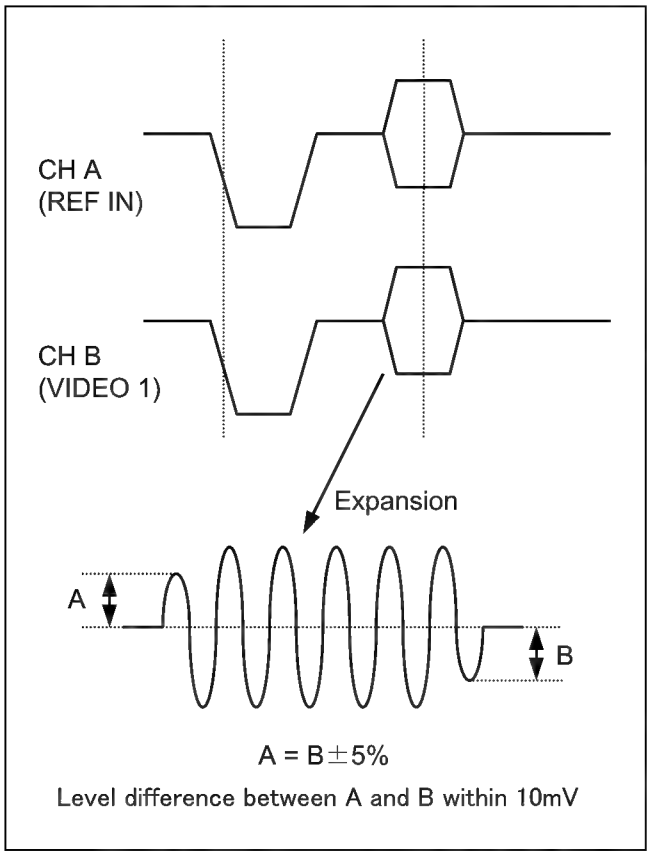




7-16. Burst Position Adjustment

P.C.B.	V_OUT (F4)
SPEC.	A = B±5% (Level difference between A and B within 10mV)
TEST	VIDEO OUT 1(CHB), REF IN(CHA)
ADJ.	VR1102 (B-1)
INPUT	REF IN: Composite 75% Color Bar
MODE	PLAY
TAPE	VFM3580KM (75% Color Bar portion)
M.EQ	Waveform Monitor

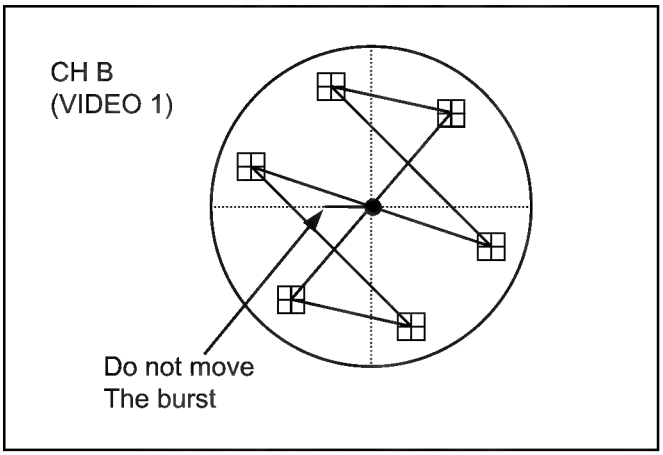
1. Adjust VR1102 while changing the channels A and B of the vector scope alternately so that the center of the burst of the reference and VIDEO OUT 1 are phase synchronized and level difference between A and B portion in specification.



7-17. Confirmation of Vector

P.C.B.	V_OUT (F4)
SPEC.	All vectors are in the Inner Boxes
TEST	VIDEO OUT 1
ADJ.	VR502 (H-1), VR501 (H-1) VR500 (H-1), VR507 (I-1)
INPUT	----------
MODE	PLAY
TAPE	VFM3580KM (75% Color Bar portion)
M.EQ	Vector Scope

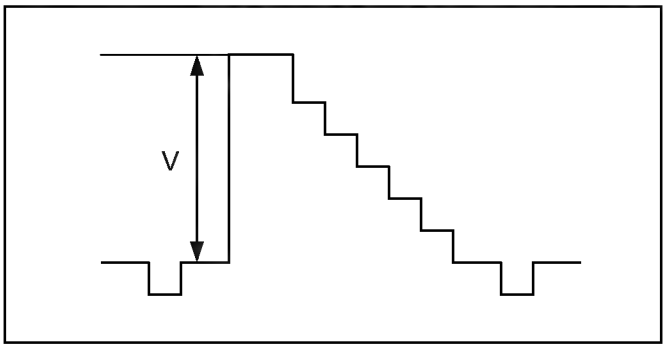
1. Set the burst position on the Vector Scope at correct position.
2. Confirm that the color bar's each vector points are in the square mark on the vector scope.
3. If out of specification, adjust the following VR's so that the color bar's each vector points are in the square mark on the vector scope.(Refer to item 7-11. Vector Adjustment).
   - VR507 : Quad Phase
   - VR502 : Hue Phase
   - VR501 : Encode PB Level
   - VR500 : Encode PR Level



7-18. Component Y Level Adjustment

P.C.B.	V_OUT (F4)
SPEC.	V = 700mV±7mV
TEST	COMPONENT Y OUT
ADJ.	VR301 (G-1)
INPUT	----------
MODE	PLAY
TAPE	VFM3580KM (75% Color Bar portion)
M.EQ	Waveform Monitor

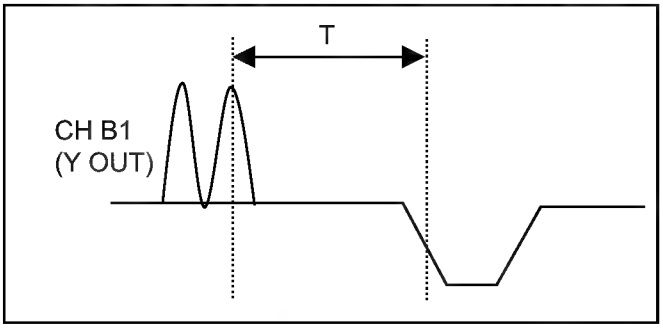
1. Set the SW400 to M Ⅱ side on V OUT P.C.Board..
2. Adjust VR301 so that the V level is 700mV±7mV.



7-19. Video Phase Adjustment

P.C.B.	V_OUT (F4)
SPEC.	T = 1.26±0.02usec
TEST	Y OUT
ADJ.	VR1050 (A-1)
INPUT	----------
MODE	PLAY
TAPE	VFM3580KM (Area Marker portion)
M.EQ	Waveform Monitor

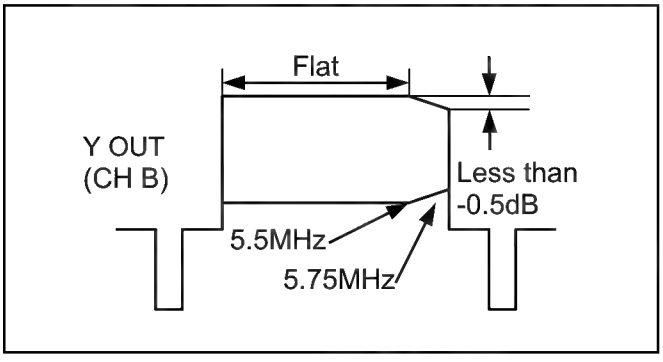
1. Open the Video Adjust menu on Service menu and set item “D01:VIDEO BLANK” to OFF position.
2. Adjust VR1050 so that the timing T is within specification.
3. After finish this adjustment, set to ON position of item “D01:VIDEO BLANK”.



7-20. Component Y Frequency Response Adjustment

P.C.B.	V_OUT (F4)
SPEC.	5.5MHz = Less than –0.5dB
TEST	COMPONENT Y OUT
ADJ.	VR304 (F-1)
INPUT	----------
MODE	PLAY
TAPE	VFM3580KM (H Sweep portion)
M.EQ	Waveform Monitor

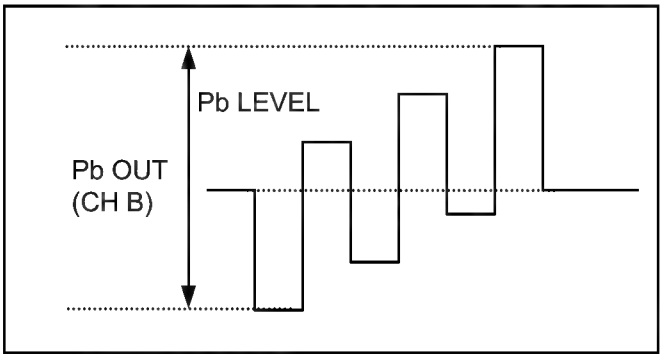
1. Adjust VR304 so that the frequency response becomes flat.



7-21. Component Pb Level Adjustment

P.C.B.	V_OUT (F4)
SPEC.	525mV±5mV
TEST	COMPONENT PB OUT
ADJ.	VR306 (E-1)
INPUT	----------
MODE	PLAY
TAPE	VFM3580KM (75% Color Bar portion)
M.EQ	Waveform Monitor

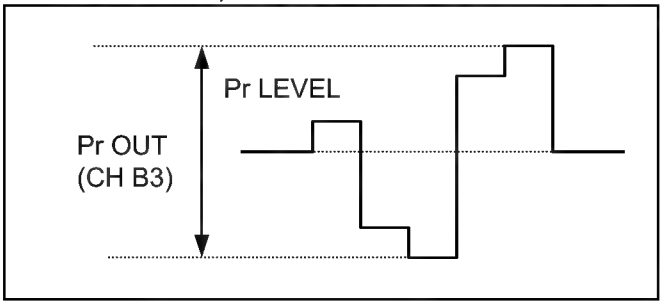
1. Set the SW400 to M Ⅱ side on V OUT P.C.Board..
2. Adjust VR306 so that the Pb level of component out is within specification.



7-22. Component Pr Level Adjustment

P.C.B.	V_OUT (F4)
SPEC.	525mV±5mV
TEST	COMPONENT Pr OUT
ADJ.	VR305 (E-1)
INPUT	----------
MODE	PLAY
TAPE	VFM3580KM (75% Color Bar portion)
M.EQ	Waveform Monitor

1. Set the SW400 to M Ⅱ side on V OUT P.C.Board..
2. Adjust VR305 so that the Pr level of component out is within specification.

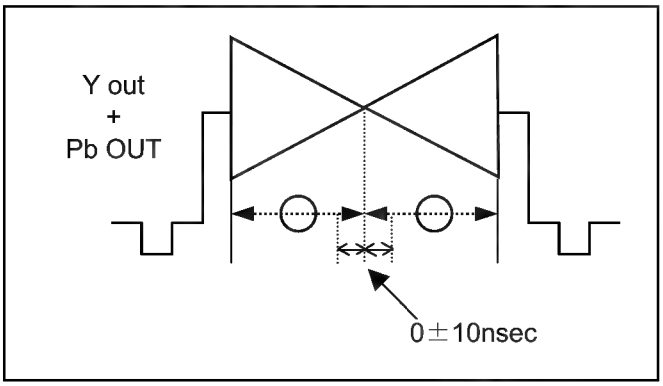


7-23. Component Y/Pb Timing Adjustment

P.C.B.	V_OUT (F4)
SPEC.	0±10nsec
TEST	COMPONENT Y OUT, PB OUT
ADJ.	VR303 (E-1)
INPUT	----------
MODE	PLAY
TAPE	VFM3580KM (Bowtie portion)
M.EQ	Waveform Monitor

1. Set the waveform monitor in the YC timing measuring mode (CH B1 + CH B2).
2. Adjust VR303 so that the cross point of the envelope is at the center.

Note: Incase of WFM monitor does not have Y-Pb timing adjustment mode, if the oscilloscope have “ADD” and “INVERT” switch, please use those switch for make below waveform.

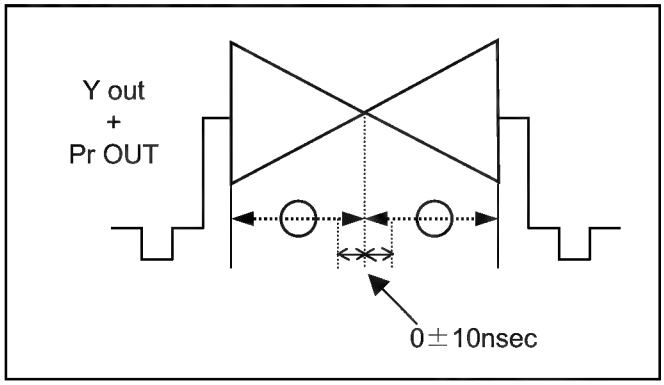


7-24. Component Y/Pr Timing Adjustment

P.C.B.	V_OUT (F4)
SPEC.	0±10nsec
TEST	COMPONENT Y OUT, Pr OUT
ADJ.	VR302 (E-1)
INPUT	----------
MODE	PLAY
TAPE	VFM3580KM (Bowtie portion)
M.EQ	Waveform Monitor

1. Set the waveform monitor in the YC timing measuring mode (CH B1 + CH B3).
2. Adjust VR302 so that the cross point of the envelope is at the center.

Note: Incase of WFM monitor does not have Y-Pb timing adjustment mode, if the oscilloscope have "ADD" and "INVERT" switch, please use those switch for make below waveform.

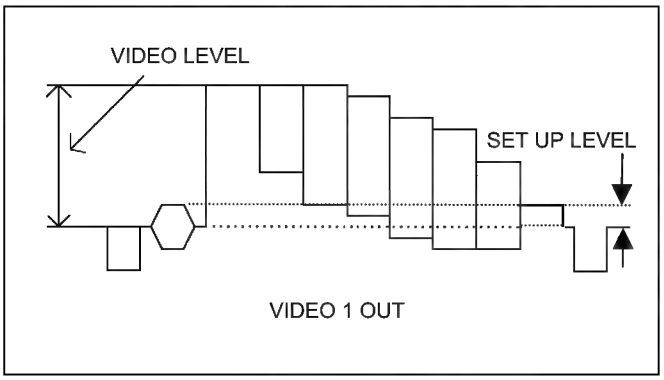


7-25. Composite Set up Adjustment (Set up ADD mode)

P.C.B.	V_OUT (F4)
SPEC.	Set up level = 7.5±0.5IRE
TEST	VIDEO 1 OUT
ADJ.	VR805 (G-1)
INPUT	----------
MODE	PLAY
TAPE	VFM3580KM (75% Color Bar portion)
M.EQ	Waveform Monitor

1. Set the item "614: VOUT SET UP" to "ADD" on Set-up menu.
2. Adjust VR805 so that the Set-up level is 7.5± 0.5IRE.

NOTE: Signal have carrier leak and noise, therefore set Y-filter mode on WFM monitor.

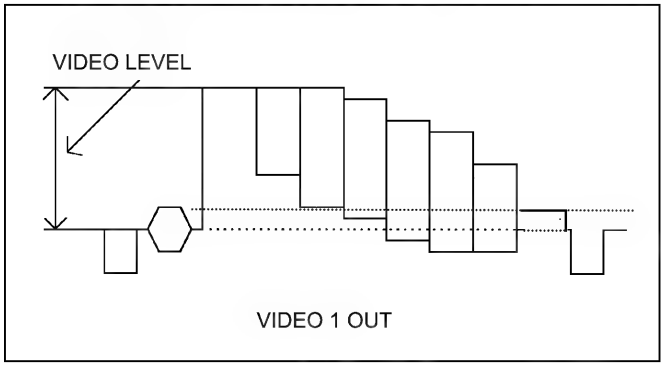


7-26. Composite Video Level Adj. (Set up ADD mode)

P.C.B.	V_OUT (F4)
SPEC.	Video level = 100±1 IRE
TEST	VIDEO 1 OUT
ADJ.	VR804 (G-1)
INPUT	----------
MODE	PLAY
TAPE	VFM3580KM (75% Color Bar portion)
M.EQ	Waveform Monitor

1. Set the item “614: VOUT SET UP” to “ADD” on Set-up menu.
2. Adjust VR804 so that the Video level is 100±1 IRE.

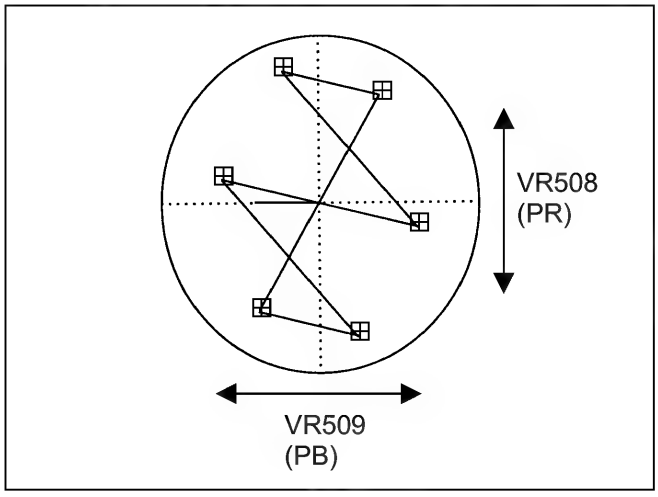
NOTE: Signal have carrier leak and noise, therefore set Y-filter mode on WFM monitor.



7-27. Vector Adjustment (Set up ADD mode)

P.C.B.	V_OUT (F4)
SPEC.	All vectors are in the Inner Boxes
TEST	VIDEO 1 OUT
ADJ.	VR508 (I-1),VR509 (I-1)
INPUT	----------
MODE	PLAY
TAPE	VFM3580KM (75% Color Bar portion)
M.EQ	Vector Scope

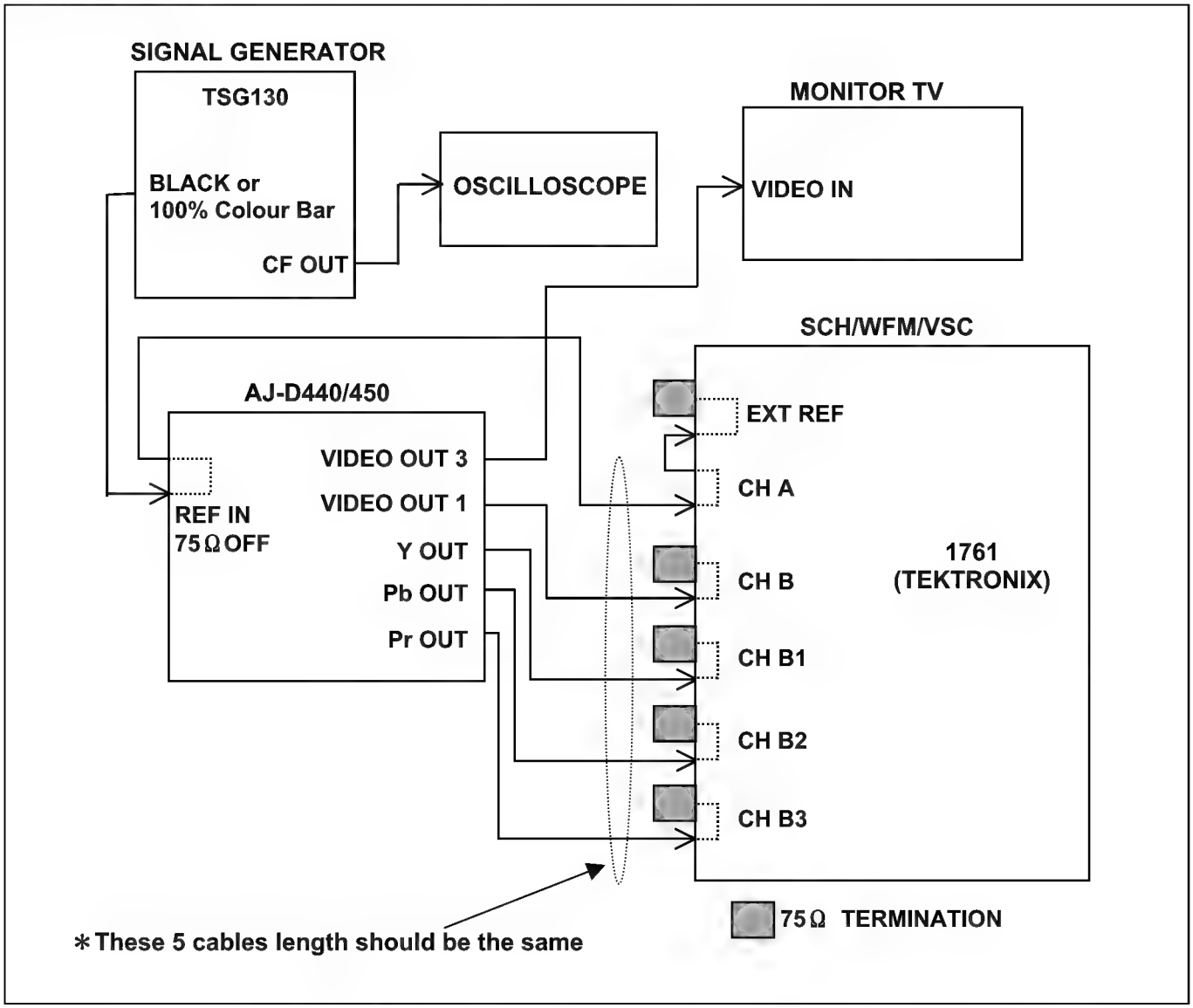
1. Set the item “614: VOUT SET UP” to “ADD” on Set-up menu.
2. Adjust VR508(PR) and VR509(PB) so that the each vector points are in the square mark on the vector scope.



7. Video Out P. C. Board (F4) [FOR PAL ONLY]

Please warm up the VTR about 10 minute before adjustment.

CONNECTION



7-1. DA Reference Voltage Adjustment

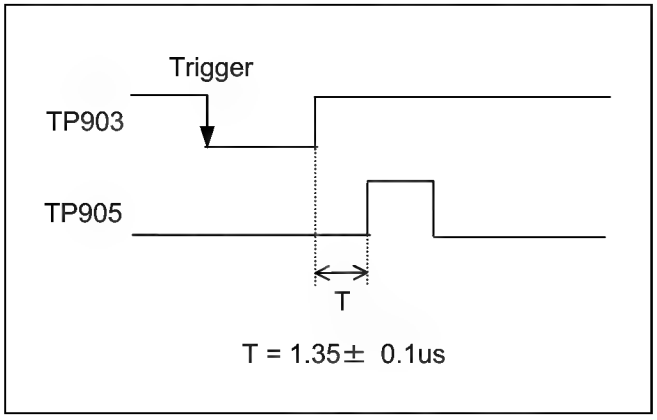
P.C.B.	V_OUT (F4)
SPEC.	3.9V± 0.05VDC
TEST	TP300 (H-3)
ADJ.	VR300 (G-1)
INPUT	REF IN: Composite 100% colour bar
MODE	EE
TAPE	----------
M.EQ	Oscilloscope

Adjust VR300 so that the voltage is 3.9V± 0.05VDC.

7-2. Sampling Position Adjustment

P.C.B.	V_OUT (F4)
SPEC.	1.35± 0.05us
TEST	TP903 (D-1), TP905 (C-2)
ADJ.	VR900 (C-1)
INPUT	REF IN: Composite 100% colour bar
MODE	EE
TAPE	----------
M.EQ	Oscilloscope

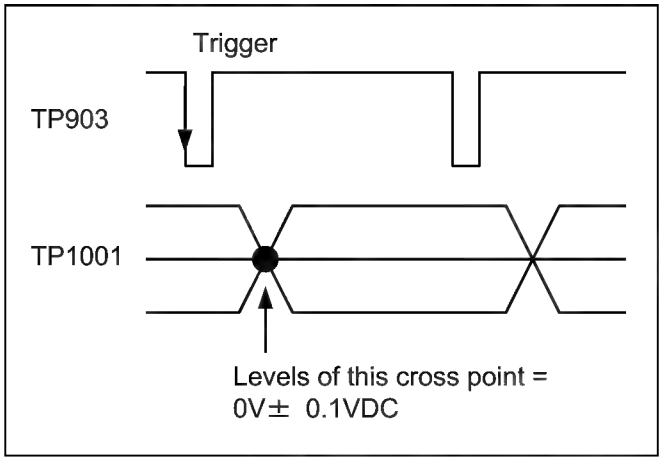
Adjust VR900 so that the phase difference is 1.35± 0.05us between the rising edge at TP903 and the rising edge at TP905 as shown in figure.



7-3. PLL Center Adjustment

P.C.B.	V_OUT (F4)
SPEC.	0V± 0.1VDC
TEST	TP903 (D-1), TP1001 (D-1)
ADJ.	VC1000 (D-2)
INPUT	REF IN: Composite 100% colour bar
MODE	EE
TAPE	----------
M.EQ	Oscilloscope

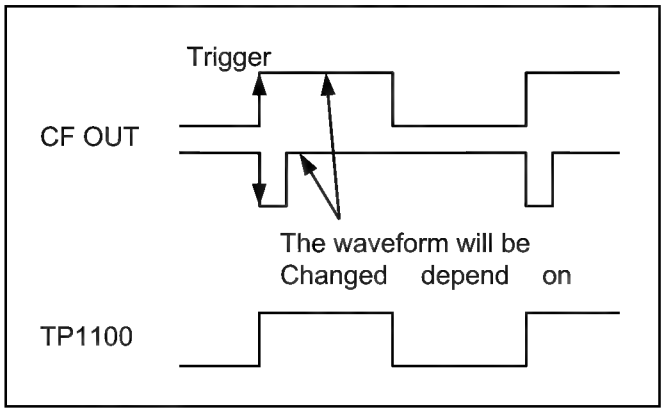
1. Adjust VC1000 so that the voltage is 0V ± 0.1VDC.



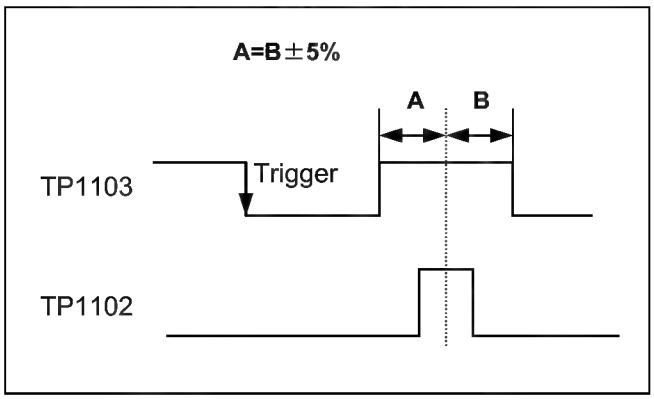
7-4. REF CF Detection Adjustment

P.C.B.	V_OUT (F4)
SPEC.	See Figure, A = B±5%
TEST	TP1100 (C-2), CF Out of Signal SG TP1102 (C-2), TP1103 (C-2)
ADJ.	VR901 (C-1)
INPUT	REF IN: Composite 100% Colour Bar
MODE	EE
TAPE	----------
M.EQ	Oscilloscope

1. Connect the oscilloscope CH1 to the CF output of composite signal generator and CH2 to TP1100.
2. Adjust VR901 so that the phase is synchronized between CF pulses and TP1100 as shown in figure.



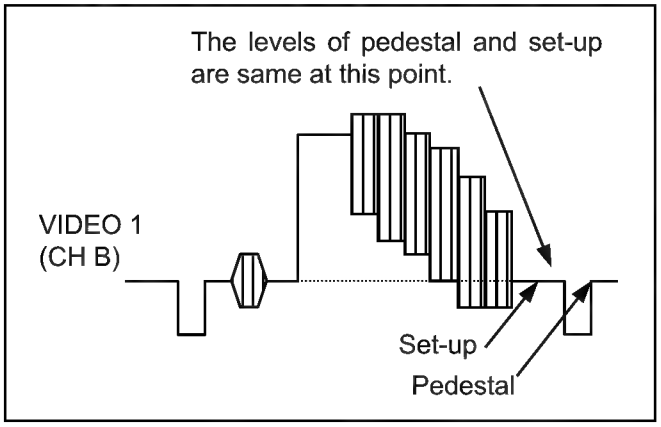
3. Connect the oscilloscope CH1 to TP1103 and CH2 to TP1102.
4. Expand (delay) the rising edge of TP1103.
5. Slowly and slightly rotate VR901 so that the high period of TP1103 is positioned at the center of stable waveform at TP1102.



7-5. Composite Set-up Adjustment

P.C.B.	V_OUT (F4)
SPEC.	Set-up Level = Pedestal Level±7mV
TEST	VIDEO OUT 1
ADJ.	VR802 (J-2)
INPUT	----------
MODE	PLAY
TAPE	VFM3680KM (100% Colour Bar portion)
M.EQ	Waveform Monitor

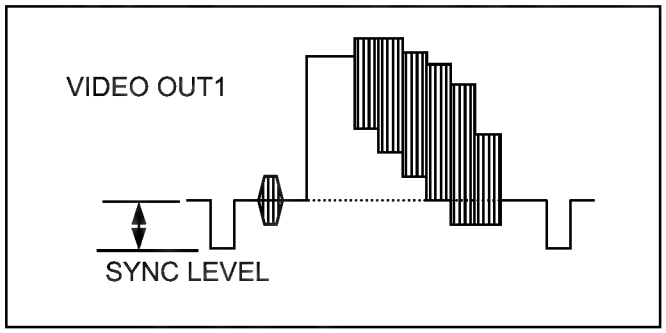
1. Adjust VR802 so that the set-up level is the same level as the pedestal level.



7-6. Sync Level Adjustment

P.C.B.	V_OUT (F4)
SPEC.	300mV±3mV
TEST	VIDEO OUT 1
ADJ.	VR400 (G-1)
INPUT	----------
MODE	PLAY
TAPE	VFM3680KM (100% Colour Bar portion)
M.EQ	Waveform Monitor

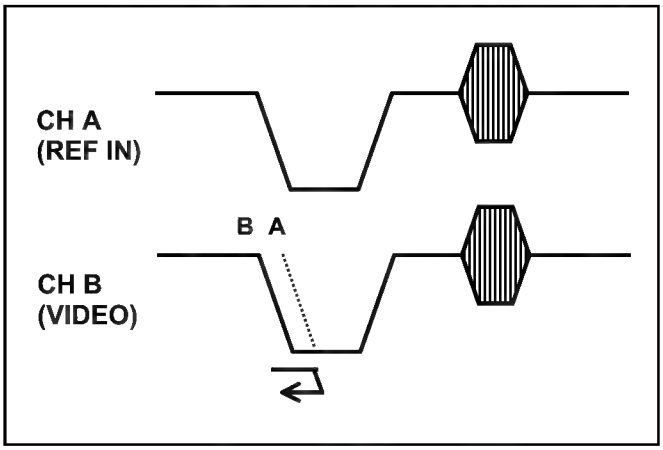
1. Adjust VR400 so that the Sync Level is 300mV± 3mV.



7-7. H Phase Adjustment

P.C.B.	V_OUT (F4)
SPEC.	Refer to below description
TEST	REF IN (CHA), VIDEO OUT 1 (CHB)
ADJ.	VR1100 (B-1)
INPUT	REF IN: Composite 100% Color Bar
MODE	PLAY
TAPE	VFM3680KM (100% Colour Bar portion)
M.EQ	Waveform Monitor

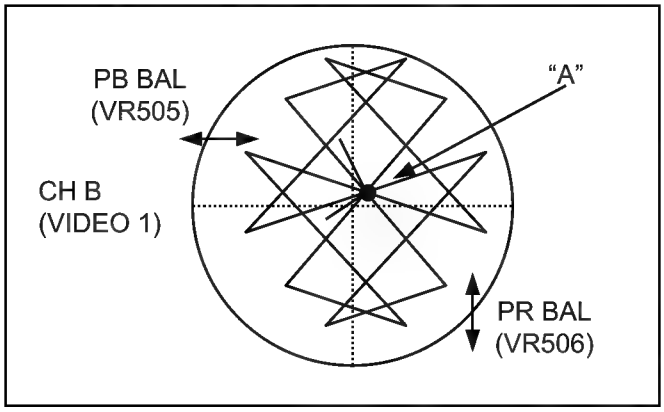
1. Set WFM in the EXT-REF MODE.
2. Adjust VR1100 so that the phase synchronized between REF IN (CHA) and VIDEO OUT 1 (CHB). Please follow the below indicated procedure.
   (1). Adjust VR1100 so that the H Phase of V OUT is at A Position.
   (2). After the item (1), adjust VR1100 so that the H Phase of V OUT is at A Position.



7-8. Carrier Balance Adjustment

P.C.B.	V_OUT (F4)
SPEC.	Cross point “A” at the center of scope.
TEST	VIDEO OUT 1
ADJ.	VR505 (I-1), VR506 (I-1)
INPUT	----------
MODE	PLAY
TAPE	VFM3680KM (100% Colour Bar portion)
M.EQ	Vector Scope

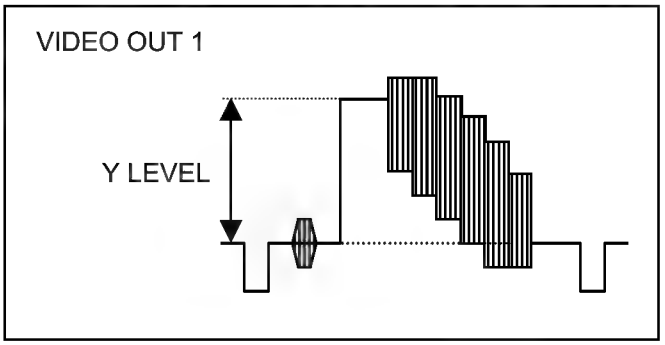
1. Adjust VR505 (PB BAL) and VR506 (PR BAL) so that the cross point “A” is positioned at the center of the vector scope.



7-9. Composite Y Level Adjustment

P.C.B.	V_OUT (F4)
SPEC.	700mV±5mV
TEST	VIDEO OUT 1
ADJ.	VR800 (I-1)
INPUT	----------
MODE	PLAY
TAPE	VFM3680KM (100% Colour Bar portion)
M.EQ	Waveform Monitor

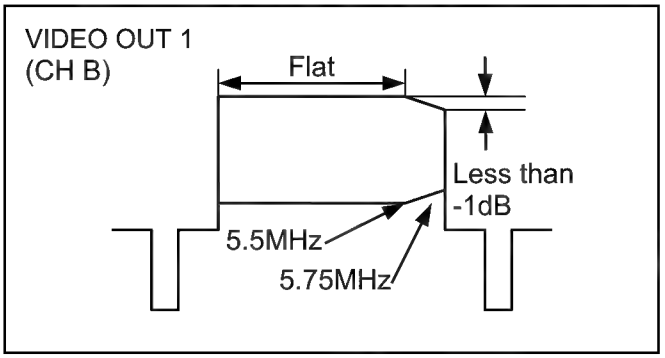
1. Adjust VR800 so that the Y level is 700mV±5mV.



7-10. Composite Y Frequency Response Adjustment

P.C.B.	V_OUT (F4)
SPEC.	5.5MHz = Less than –1dB
TEST	VIDEO OUT 1
ADJ.	VR801 (I-1)
INPUT	----------
MODE	PLAY
TAPE	VFM3680KM (H-Sweep portion)
M.EQ	Waveform Monitor

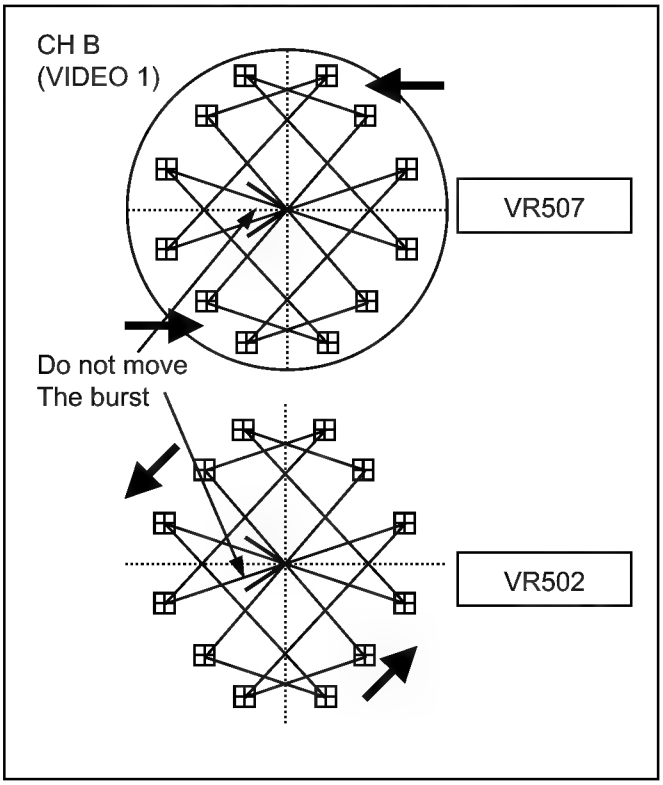
1. Adjust VR801 so that the frequency response becomes flat.
   a) The level of 5.5MHz portion is less than –1dB.
   b) The middle frequency is flat.

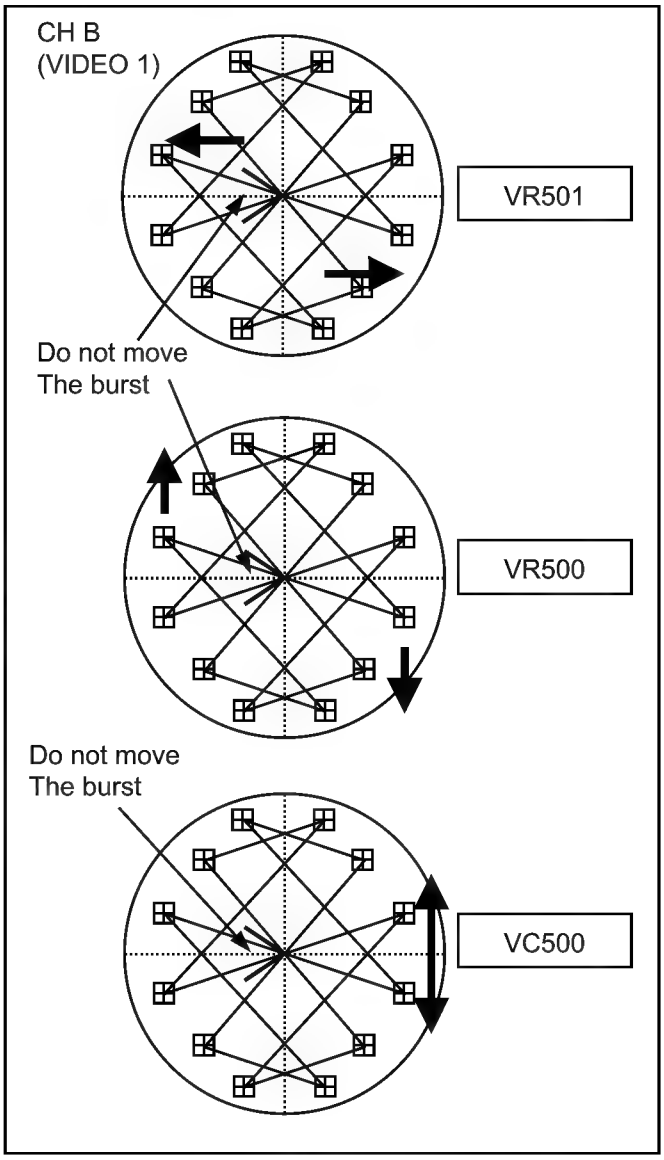


7-11. Vector Adjustment

P.C.B.	V_OUT (F4)
SPEC.	All vectors are in the Inner Boxes
TEST	VIDEO OUT 1
ADJ.	VR507 (I-1), VR502 (H-1), VR501 (H-1) VR500 (H-1), VC500 (I-3)
INPUT	----------
MODE	PLAY
TAPE	VFM3680KM (100% Colour Bar portion)
M.EQ	Vector Scope

1. Set the burst position on the Vector Scope at correct position.
2. Adjust the following VR's so that the colour bar's each vector points are in the square mark on the vector scope.
   - VR507 : Quad Phase
   - VR502 : Hue Phase
   - VR501 : Encode PB Level
   - VR500 : Encode PR Level
   - VC500 : PAL Phase

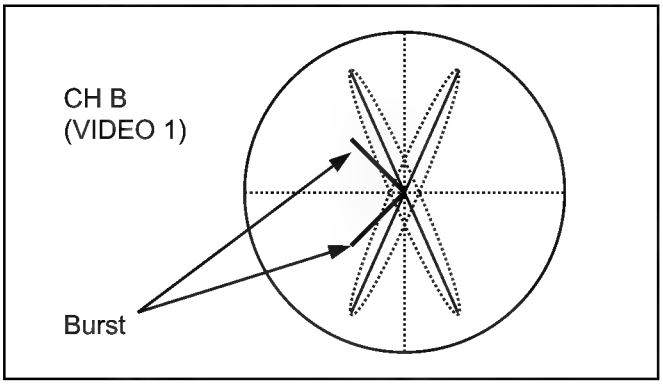




7-12. Composite Pb/Pr Timing Adjustment

P.C.B.	V_OUT (F4)
SPEC.	0±10nsec
TEST	VIDEO OUT 1
ADJ.	VR307 (F-1)
INPUT	----------
MODE	PLAY
TAPE	VFM3680KM (Bowtie portion)
M.EQ	Vector Scope

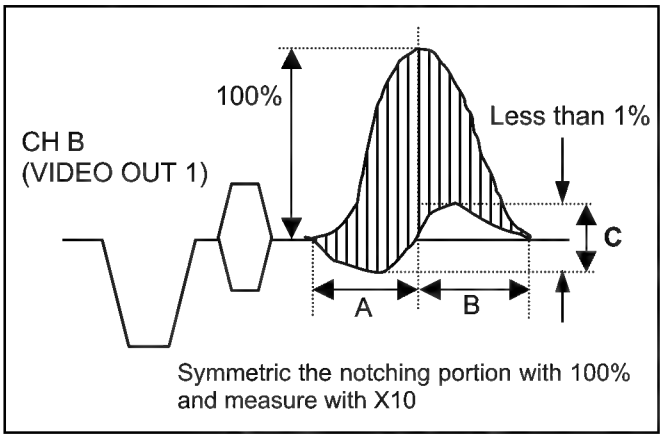
1. Adjust VR307 so that the signal on the vector scope becomes 2 straight lines (X) as shown in figure.



7-13. Composite Y/C Timing Adjustment

P.C.B.	V_OUT (F4)
SPEC.	0±10nsec (C = less than 1%)
TEST	VIDEO OUT 1
ADJ.	VR803 (I-1)
INPUT	----------
MODE	PLAY
TAPE	VFM3680KM (Pulse Bar portion)
M.EQ	Waveform Monitor

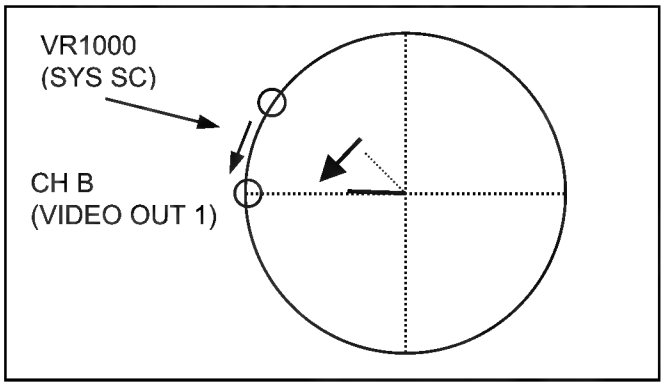
1. Adjust VR803 so that the portion A and B are become symmetric left and right and level of portion C less than 1% against level of waveform 100% as shown in figure.
2. When performing this adjustment, the level of waveform may be changed. Therefore, level of waveform is adjusted by Chroma VR on the front panel during this adjustment.
3. After finish this adjustment set the Chroma VR to preset position.
4. After completion of this adjustment, “7-14. Sub-Carrier Phase Adjustment” should be performed.



7-14. Sub-Carrier Phase Adjustment

P.C.B.	V_OUT (F4)
SPEC.	0±1degree
TEST	VIDEO OUT 1 (CHB), REF IN (CHA)
ADJ.	VR1000 (B-1)
INPUT	REF IN: Composite 100% Colour Bar
MODE	PLAY
TAPE	VFM3680KM (100% Colour Bar portion)
M.EQ	SCH Meter

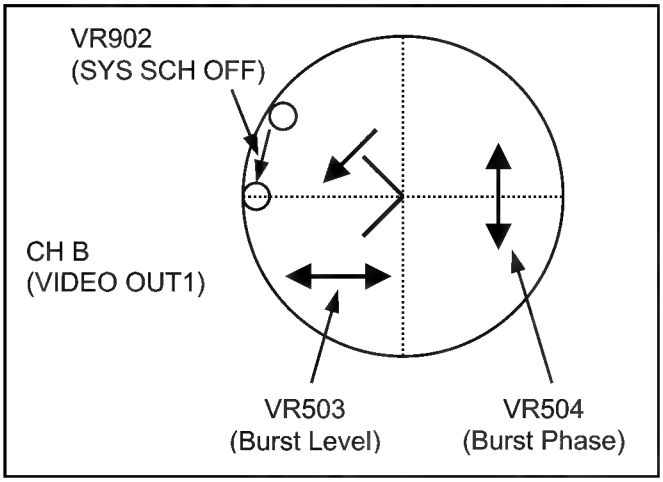
1. Adjust VR1000 so that the SCH of VIDEO OUT(CHB) is same as EXT-REF-IN(CHA), then SCH phase should be become 0±1 degree.



7-15. Burst Adjustment

P.C.B.	V_OUT (F4)
SPEC.	SCH PHASE: 0±3 degree BURST LEVEL: 300mV±3mV
TEST	VIDEO OUT 1 (CHB), REF IN (CHA)
ADJ.	VR902 (B-1), VR503 (H-1), VR504 (H-1)
INPUT	REF IN: Composite 100% Colour Bar
MODE	PLAY
TAPE	VFM3680KM (100% Colour Bar portion)
M.EQ	SCH Meter

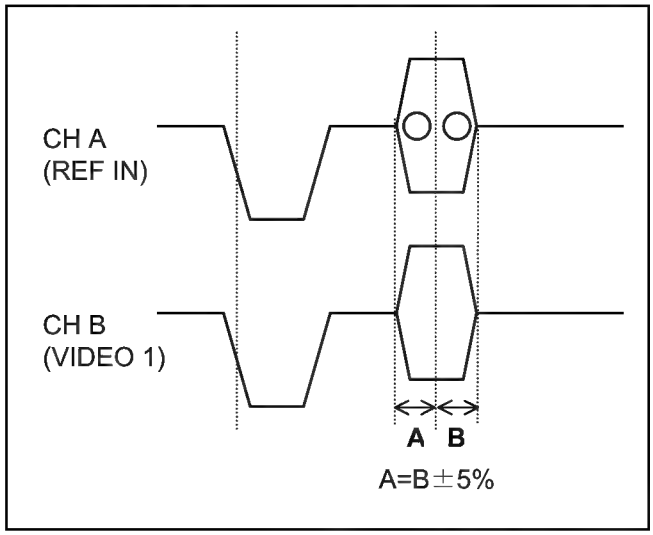
1. Adjust VR902 while changing the channels A and B of the SCH meter alternately so that the SCH is 0±5degree.
2. Adjust VR503 and VR504 while changing the channels A and B of the SCH meter alternately so that the burst level and burst phase are become same between VIDEO OUT 1 (CHB) and REF(CHA).
3. Adjust VR503 so that the burst level is become 300mV±3mV (measure by WFM).



7-16. Burst Position Adjustment

P.C.B.	V_OUT (F4)
SPEC.	A = B±5%
TEST	VIDEO OUT 1(CHB), REF IN(CHA)
ADJ.	VR1102 (B-1)
INPUT	REF IN: Composite 100% Colour Bar
MODE	PLAY
TAPE	VFM3680KM (100% Colour Bar portion)
M.EQ	Waveform Monitor

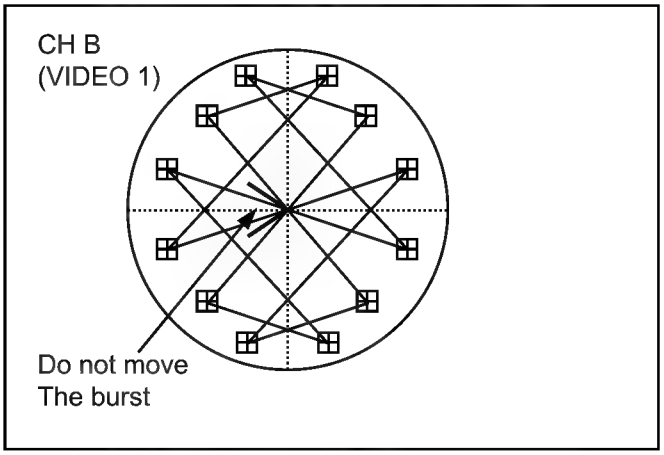
1. Adjust VR1102 while changing the channels A and B of the waveform monitor alternately so that the center of the burst of the reference and VIDEO OUT 1 are phase synchronized and phase difference between A and B portion in specification.



7-17. Confirmation of Vector

P.C.B.	V_OUT (F4)
SPEC.	All vectors are in the Inner Boxes
TEST	VIDEO OUT 1
ADJ.	VR502 (H-1), VR501 (H-1) VR500 (H-1), VR507 (I-1), VC500 (I-3)
INPUT	----------
MODE	PLAY
TAPE	VFM3580KM (100% Colour Bar portion)
M.EQ	Vector Scope

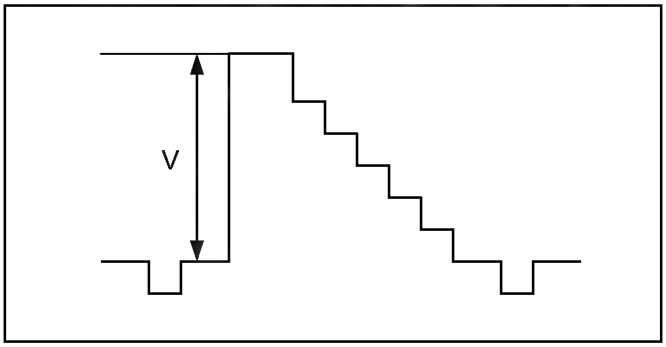
1. Set the burst position on the Vector Scope at correct position.
2. Confirm that the colour bar's each vector points are in the square mark on the vector scope.
3. If out of specification, adjust the following VR's so that the colour bar's each vector points are in the square mark on the vector scope.(Refer to item 7-11. Vector Adjustment).
   - VR507 : Quad Phase
   - VR502 : Hue Phase
   - VR501 : Encode PB Level
   - VR500 : Encode PR Level
   - VC500 : PAL Phase



7-18. Component Y Level Adjustment

P.C.B.	V_OUT (F4)
SPEC.	V = 700mV±7mV
TEST	COMPONENT Y OUT
ADJ.	VR301 (G-1)
INPUT	----------
MODE	PLAY
TAPE	VFM3680KM (100% Color Bar portion)
M.EQ	Waveform Monitor

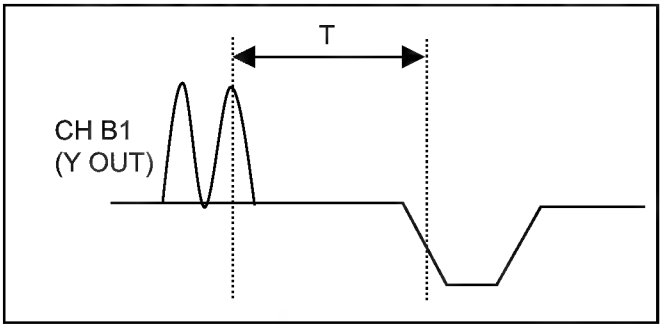
1. Adjust VR301 so that the V level is 700mV±7mV.



7-19. Video Phase Adjustment

P.C.B.	V_OUT (F4)
SPEC.	T = 0.96±0.02usec
TEST	Y OUT
ADJ.	VR1050 (A-1)
INPUT	----------
MODE	PLAY
TAPE	VFM3680KM (Area Marker portion)
M.EQ	Waveform Monitor

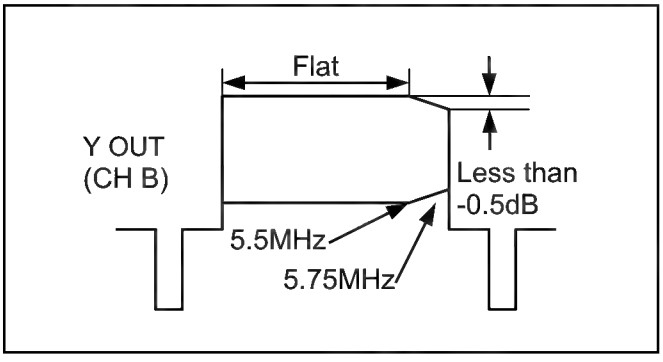
1. Open the Video Adjust menu on Service menu and set item "D01:VIDEO BLANK" to OFF position.
2. Adjust VR1050 so that the timing T is within specification.
3. After finish this adjustment, set to ON position of item "D01:VIDEO BLANK".



7-20. Component Y Frequency Response Adjustment

P.C.B.	V_OUT (F4)
SPEC.	5.5MHz = Less than –0.5dB
TEST	COMPONENT Y OUT
ADJ.	VR304 (F-1)
INPUT	----------
MODE	PLAY
TAPE	VFM3680KM (H Sweep portion)
M.EQ	Waveform Monitor

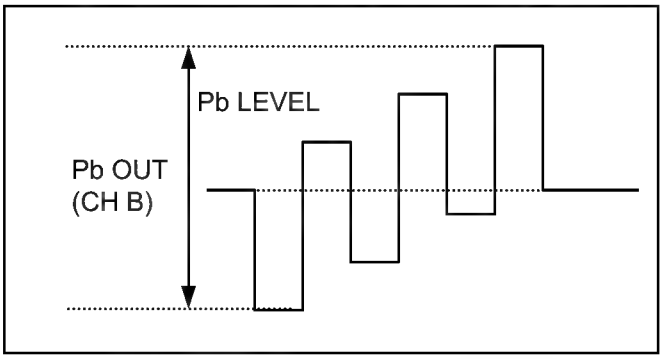
1. Adjust VR304 so that the frequency response becomes flat.



7-21. Component Pb Level Adjustment

P.C.B.	V_OUT (F4)
SPEC.	700mV±7mV
TEST	COMPONENT PB OUT
ADJ.	VR306 (E-1)
INPUT	----------
MODE	PLAY
TAPE	VFM3680KM (100% Color Bar portion)
M.EQ	Waveform Monitor

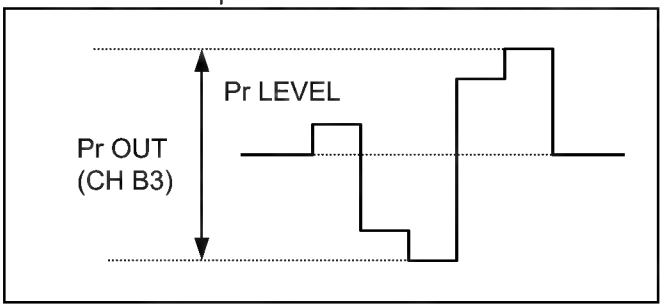
1. Adjust VR306 so that the Pb level of component out is within specification.



7-22. Component Pr Level Adjustment

P.C.B.	V_OUT (F4)
SPEC.	700mV±7mV
TEST	COMPONENT Pr OUT
ADJ.	VR305 (E-1)
INPUT	----------
MODE	PLAY
TAPE	VFM3680KM (100% Color Bar portion)
M.EQ	Waveform Monitor

1. Adjust VR305 so that the Pr level of component out is within specification.

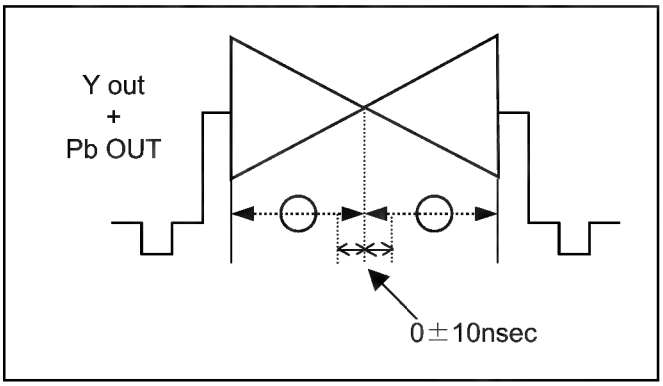


7-23. Component Y/Pb Timing Adjustment

P.C.B.	V_OUT (F4)
SPEC.	0±10nsec
TEST	COMPONENT Y OUT, PB OUT
ADJ.	VR303 (E-1)
INPUT	----------
MODE	PLAY
TAPE	VFM3680KM (Bowtie portion)
M.EQ	Waveform Monitor

1. Set the waveform monitor in the YC timing measuring mode (CH B1 + CH B2).
2. Adjust VR303 so that the cross point of the envelope is at the center.

Note: Incase of WFM monitor does not have Y-Pb timing adjustment mode, if the oscilloscope have "ADD" and "INVERT" switch, please use those switch for make below waveform.

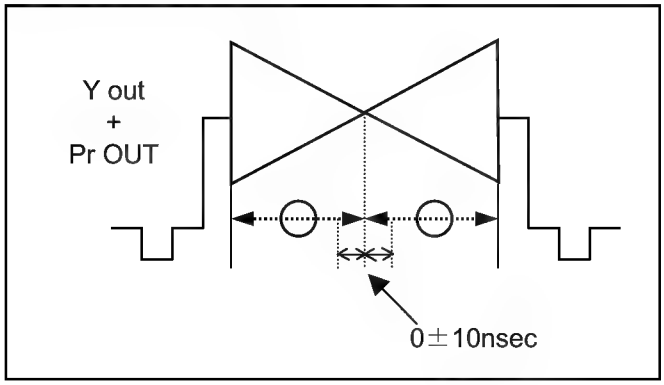


7-24. Component Y/Pr Timing Adjustment

P.C.B.	V_OUT (F4)
SPEC.	0±10nsec
TEST	COMPONENT Y OUT, Pr OUT
ADJ.	VR302 (E-1)
INPUT	----------
MODE	PLAY
TAPE	VFM3680KM (Bowtie portion)
M.EQ	Waveform Monitor

1. Set the waveform monitor in the YC timing measuring mode (CH B1 + CH B3).
2. Adjust VR302 so that the cross point of the envelope is at the center.

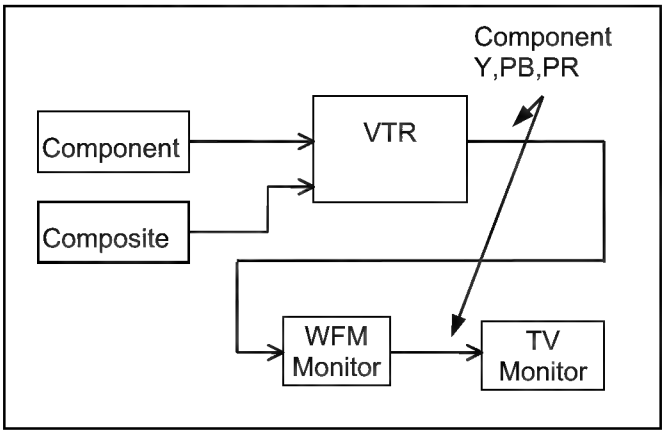
Note: Incase of WFM monitor does not have Y-Pb timing adjustment mode, if the oscilloscope have "ADD" and "INVERT" switch, please use those switch for make below waveform.



8. V IN P. C. Board
[AJ-D450 only: For NTSC]

8-1. Preparation for Video In Adjustment

1. Connect the equipment as shown in the figure.
2. V IN P.C.Board adjustment should be performed after the V OUT P.C.Board adjustment.
3. Set the menu and SW as follows.
   SET UP MENU 613: V IN SETUP → THOU
   614: V OUT SETUP → THOU
   600: PB PR IN LV → MⅡ
   - SW400→ MⅡ (V OUT P.C.Board.)



8-2. 13.5MHz VCO Adjustment

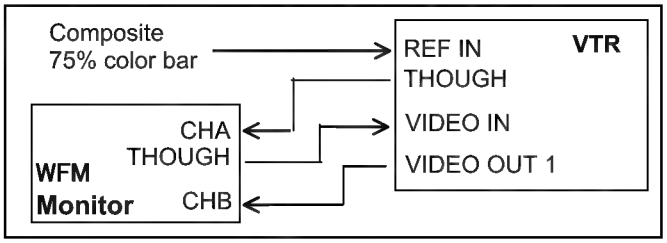
P.C.B.	V_IN (F6)
SPEC.	0V± 0.1V
TEST	TP553(E-2)
ADJ.	VL551(F-2), VR552(F-2)
INPUT	Component 100% Color Bar
MODE	EE
TAPE	----------
M.EQ	Oscilloscope

1. Set VR552 to center position.
2. Adjust VL551 so that the DC Voltage is 0V± 0.1V.
   ＊ First, turn VL551 to CCW.

8-3. Component Y Timing Adjustment

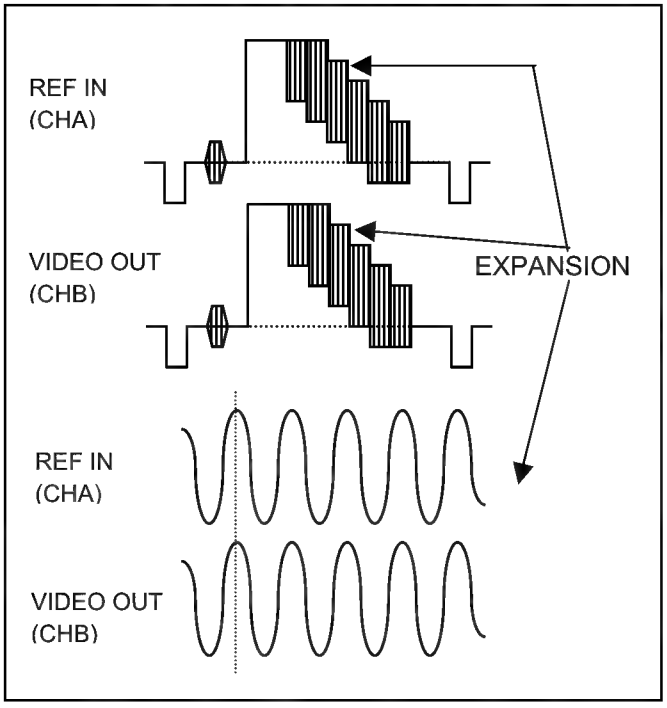
P.C.B.	V_IN (F6)
SPEC.	Phase synchronized between REF IN and VIDEO OUT 1.
TEST	REF IN, VIDEO OUT 1
ADJ.	VR551(E-2)
INPUT	Composite 100% Color Bar
MODE	EE
TAPE	----------
M.EQ	WFM Monitor

1. Connect the cables as indicated as below.



2. Expand the GREEN portion of color bar signal.
3. Adjust VR551 while change the CHA and CHB of WFM monitor so that the phase synchronized between CHA（REF IN） and CHB (VIDEO OUT).

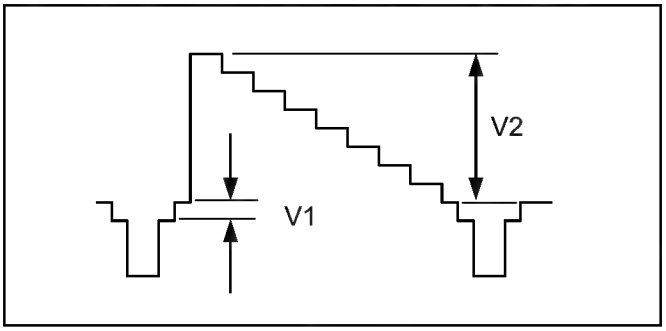
NOTE: This adjustment should be performed after V OUT P.C.Board adjustment.



8-4. Component Y Level Adjustment

P.C.B.	V_IN (F6)
SPEC.	V1 = 0V±7mV, V2 = 700mV±7mV
TEST	Y OUT
ADJ.	VR652(C-2), VR651(C-3)
INPUT	Component 100% Color Bar
MODE	EE
TAPE	----------
M.EQ	Waveform Monitor

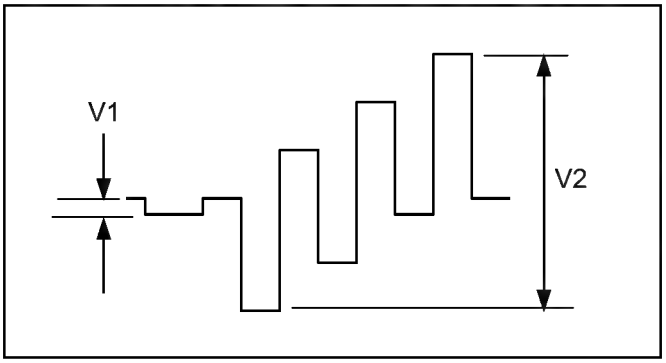
1. Adjust VR652 so that the V1 is 0V±7mV.
2. Adjust VR651 so that the V2 is 700mV±7mV.



8-5. Component PB Level Adjustment

P.C.B.	V_IN (F6)
SPEC.	V1 = 0V±7mV, V2 = 700mV±7mV
TEST	PB OUT
ADJ.	VR703(A-2), VR702(A-2)
INPUT	Component 100% Color Bar
MODE	EE
TAPE	----------
M.EQ	Waveform Monitor

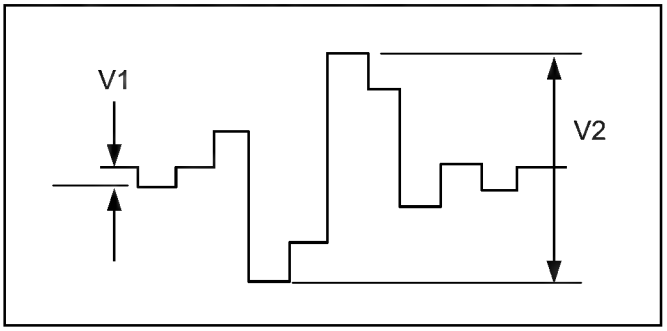
1. Adjust VR703 so that the V1 is 0±7mV.
2. Adjust VR702 so that the V2 is 700m±7mV.



8-6. Component PR Level Adjustment

P.C.B.	V_IN (F6)
SPEC.	V1 = 0V±7mV, V2 = 700mV±7mV
TEST	PR OUT
ADJ.	VR753(A-1), VR752(B-1)
INPUT	Component 100% Color Bar
MODE	EE
TAPE	----------
M.EQ	Waveform Monitor

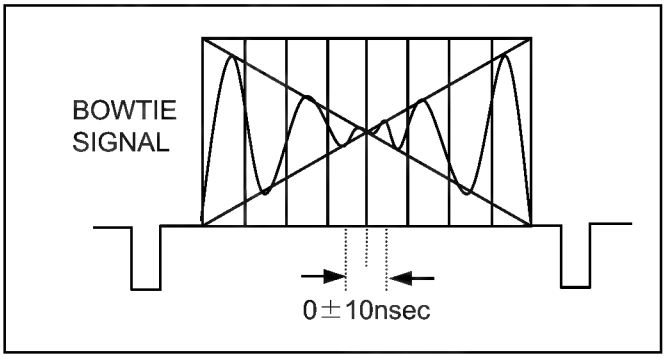
1. Adjust VR753 so that the V1 is 0V±7mV.
2. Adjust VR752 so that the V2 is 700mV±7mV.



8-7. Component Y/C Timing Adjustment

P.C.B.	V_IN (F6)
SPEC.	0±10nsec
TEST	Y, PB, PR OUT
ADJ.	VR701(B-2), VR751(B-1)
INPUT	Component IN : BOWTIE
MODE	EE
TAPE	----------
M.EQ	Waveform Monitor

1. Adjust VR701(PB) so that the minimum level of the Y/PB timing signal is 0±10nsec against the center scale.
   Adjust VR751(PR) so that the minimum level of the Y/PB timing signal is 0±10nsec against the center scale.

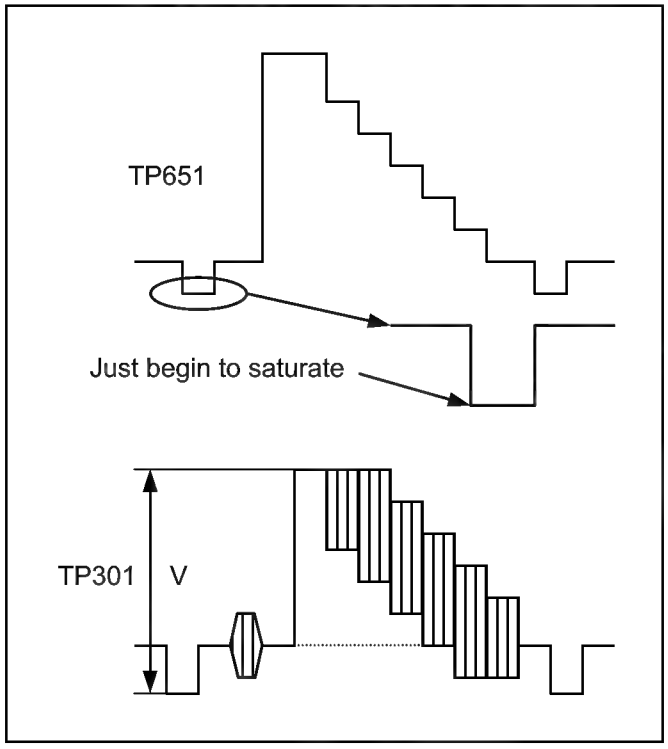


8-8. Composite Input Level Adjustment

P.C.B.	V_IN (F6)
SPEC.	V1 = 1.6V±0.02V
TEST	TP651(C-3), TP301(I-3)
ADJ.	VR301(I-2), VR251(I-3)
INPUT	COMPOSITE 75% Color Bar (Set up 7.5%)
MODE	EE
TAPE	----------
M.EQ	Oscilloscope

1. Observe TP651 and adjust VR301 at the point where the sync tip just begin to saturate.
2. Adjust VR251 so that the voltage at TP301 is 1.6V ±0.02V.

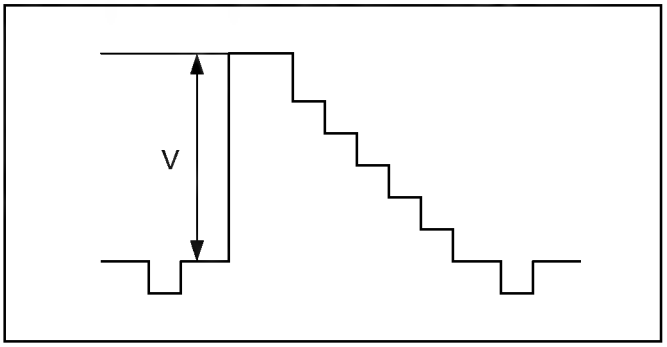
   NOTE: Oscilloscope trigger should be connect to Connector P2-16a



8-9. Composite Y Level Adjustment

P.C.B.	V_IN (F6)
SPEC.	V = 700mV±7mV
TEST	Y OUT
ADJ.	VR352(I-1)
INPUT	COMPOSITE 75% Color Bar (Set up 7.5%)
MODE	EE
TAPE	----------
M.EQ	Waveform Monitor

1. Adjust VR352 so that the V is 700mV±7mV.

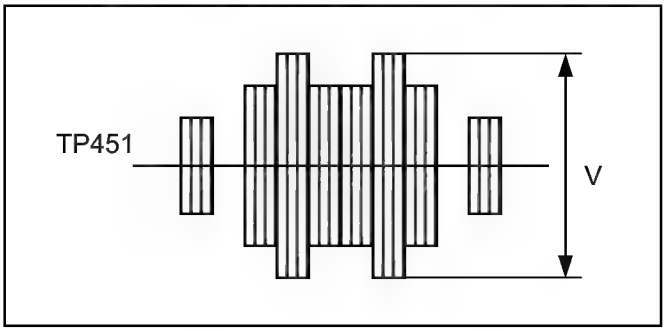


8-10.Composite Color Level Adj.

P.C.B.	V_IN (F6)
SPEC.	V = 360mV±20mV
TEST	TP451(H-1)
ADJ.	VR351(I-1)
INPUT	COMPOSITE 75% Color Bar (Set up 7.5%)
MODE	EE
TAPE	----------
M.EQ	Waveform Monitor

1. Adjust VR351 so that the V is 360mV±20mV.

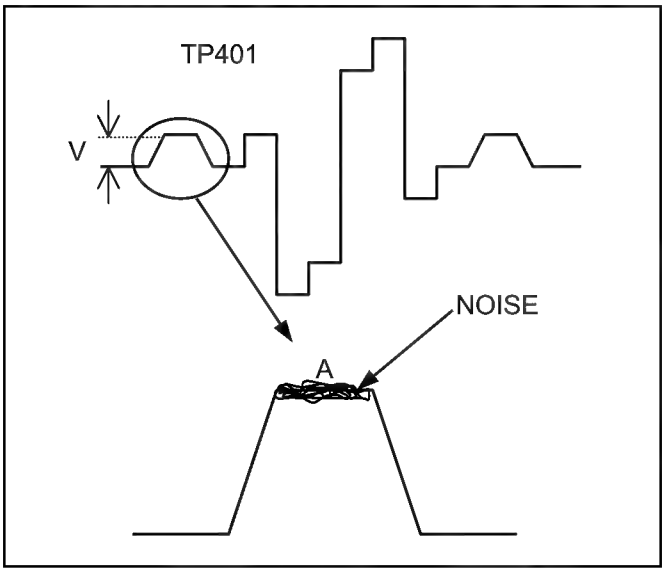
   NOTE: Oscilloscope trigger should be connect to Connector P2-16a.



8-11. Composite Color Demodulation Adjustment

P.C.B.	V_IN (F6)
SPEC.	See figure
TEST	TP401(F-2)
ADJ.	VR408(H-2), VR409(G-2)
INPUT	COMPOSITE 75% Color Bar (Set up 7.5%)
MODE	EE
TAPE	----------
M.EQ	Oscilloscope

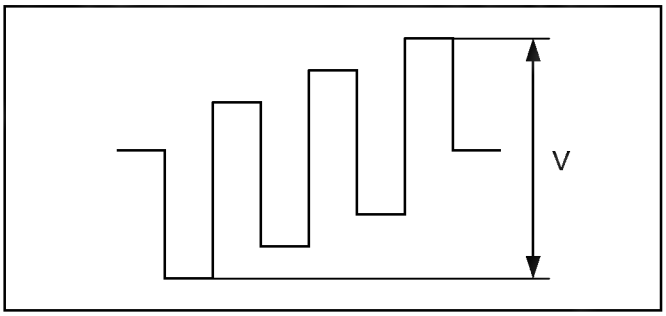
1. Turn VR409 to fully counter-clockwise.
2. Adjust VR408 so that the noise portion is positioned on the top of A portion as shown in figure.
3. Adjust VR409 so that the level V is become 0Vp-p.



8-12. Composite PB Level Adjustment

P.C.B.	V_IN (F6)
SPEC.	V = 486mV±7mV
TEST	PB OUT
ADJ.	VR460(G-1)
INPUT	COMPOSITE 75% Color Bar (Set up 7.5%)
MODE	EE
TAPE	----------
M.EQ	Waveform Monitor

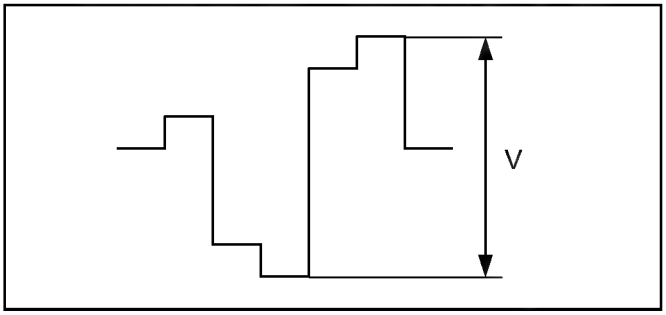
1. Adjust VR460 so that the V is 486mV±7mV



8-13. Composite PR Level Adjustment

P.C.B.	V_IN (F6)
SPEC.	V = 486mV±7mV
TEST	PR OUT
ADJ.	VR464(F-1)
INPUT	COMPOSITE 75% Color Bar (Set up 7.5%)
MODE	EE
TAPE	----------
M.EQ	Waveform Monitor

1. Adjust VR464 so that the V is 486mV±7mV

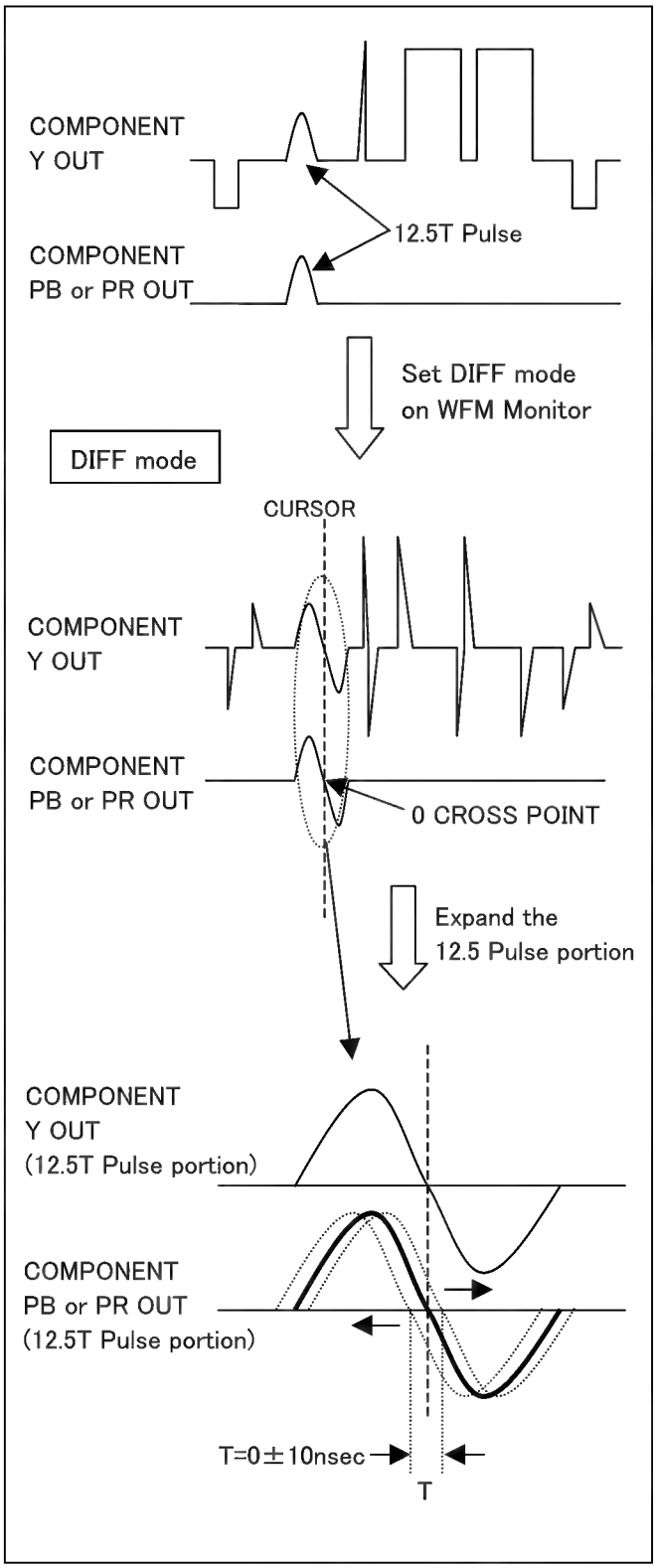


8-14. Composite YC Timing Adjustment

P.C.B.	V_IN (F6)
SPEC.	T = 0±10nsec
TEST	Y PR PB OUT
ADJ.	VR459(G-1), VR463(G-1)
INPUT	Composite IN : 12.5T Pulse & Bar
MODE	EE
TAPE	----------
M.EQ	Waveform Monitor

1. Confirm that the 12.5T Pulse & Bar signal appeared correctly on the scope with Component Y OUT as shown in figure.
2. Confirm that the 12.5T Pulse portion appeared correctly on the scope with Component PB and PR OUT as shown in figure.
3. Set WFM monitor to DIFF mode. In case of set the DIFF mode, waveform of Y, PB and PR signals are integrated as shown in figure.
4. Expand the 12.5 pulse portion (an ellipse dotted portion as indicated as figure) and set the cursor to 0 cross point as shown in figure.
5. Sine-wave is appeared on the scope by expansion as shown in figure.
6. Adjust VR459(PB) and VR463(PR) so that the phase synchronized between Y and PB, PR signals.

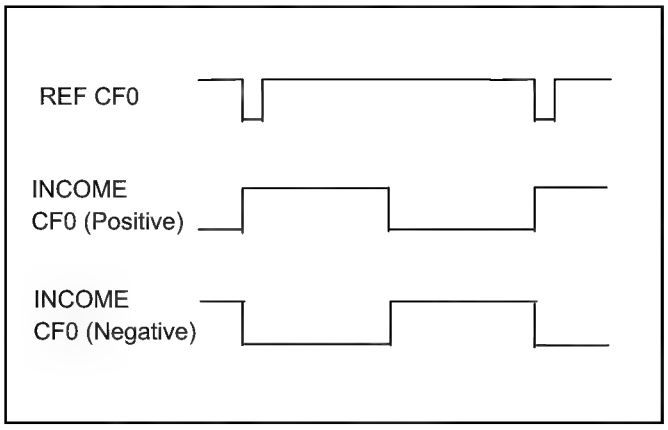
NOTE: Please use type of WFM Monitor attached DIFF mode



8-15. Composite SCH Detection Adjustment

P.C.B.	V_IN (F6)
SPEC.	See below
TEST	CF OUT (TEST SIG GEN) Connector P2-8C (INCOME CF0 pulse)
ADJ.	VR407(H-2)
INPUT	COMPOSITE 75% Color Bar (Set up 7.5%)
MODE	EE
TAPE	----------
M.EQ	Oscilloscope

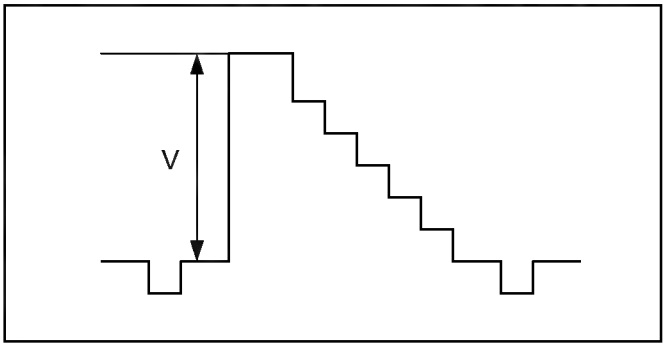
1. Set VR407 fully CCW.
2. If Income CF0 pulse does not negative pulse, slowly turn VR407 CW and set the position where the Income CF0 pulse just changes from the positive to negative phase as shown in below figure.
3. Set the VR407 so that the phase of Income CF0 pulse just changes from the negative to positive position as shown in below figure. Memorized this adjusted position of VR as position A.
4. Set the VR407 so that the phase of Income CF0 pulse just changes from the positive to negative position as shown in below figure. Memorized this adjusted position of VR as position B.
5. Set the VR407 so that the center between position A and B.



8-16. YC Y Level Adjustment

P.C.B.	V_IN (F6)
SPEC.	V = 700mV±7mV
TEST	Y OUT
ADJ.	VR354(H-1)
INPUT	S-VIDEO: 75% Color Bar (Set up 7.5%)
MODE	EE
TAPE	----------
M.EQ	Waveform Monitor

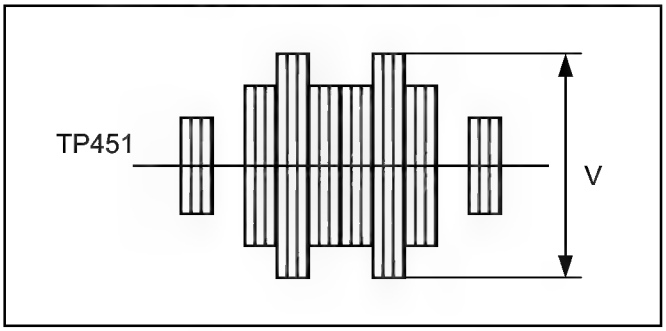
1. Adjust VR354 so that the V is 700mV±7mV.



8-17.YC Color Level Adj.

P.C.B.	V_IN (F6)
SPEC.	V = 360mV±20mV
TEST	TP451(H-1)
ADJ.	VR353(H-2)
INPUT	S-VIDEO: 75% Color Bar (Set up 7.5%)
MODE	EE
TAPE	----------
M.EQ	Waveform Monitor

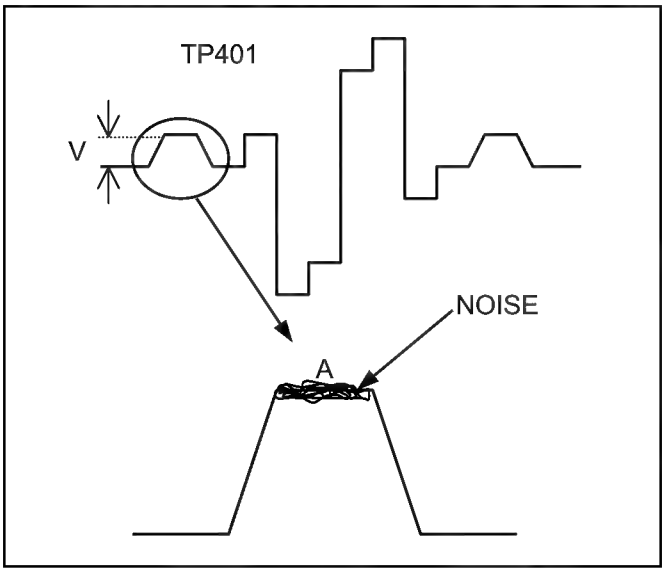
1. Adjust VR353 so that the V is 360mV±20mV.
   NOTE: Oscilloscope trigger should be connect to Connector P2-16a.



8-18. YC Color Demodulation Adjustment

P.C.B.	V_IN (F6)
SPEC.	See figure
TEST	TP401(F-2)
ADJ.	VR409(G-2), VR410(G-2)
INPUT	S-VIDEO: 75% Color Bar (Set up 7.5%)
MODE	EE
TAPE	----------
M.EQ	Oscilloscope

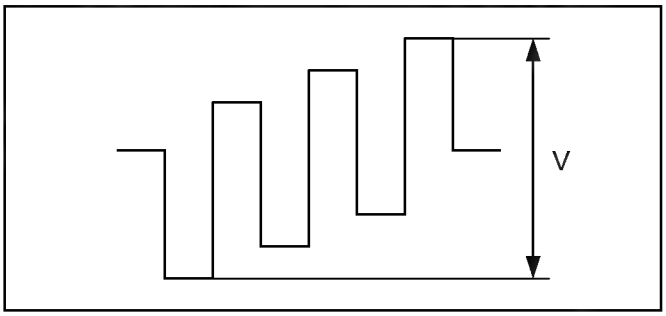
1. Turn VR409 to fully counter-clockwise.
2. Adjust VR410 so that the noise portion is positioned on the top of A portion as shown in figure.
3. Adjust VR409 so that the level V is become 0Vp-p.



8-19. YC PB Level Adjustment

P.C.B.	V_IN (F6)
SPEC.	V = 486mV±7mV
TEST	PB OUT
ADJ.	VR462(F-1)
INPUT	S-VIDEO: 75% Color Bar (Set up 7.5%)
MODE	EE
TAPE	----------
M.EQ	Waveform Monitor

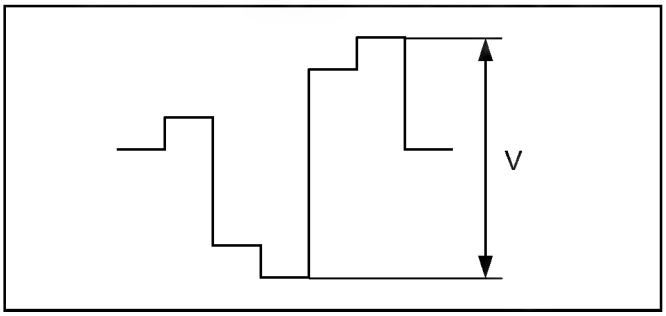
1. Adjust VR462 so that the V is 486mV±7mV



8-20. YC PR Level Adjustment

P.C.B.	V_IN (F6)
SPEC.	V = 486mV±7mV
TEST	PR OUT
ADJ.	VR466(E-1)
INPUT	S-VIDEO: 75% Color Bar (Set up 7.5%)
MODE	EE
TAPE	----------
M.EQ	Waveform Monitor

1. Adjust VR466 so that the V is 486mV±7mV

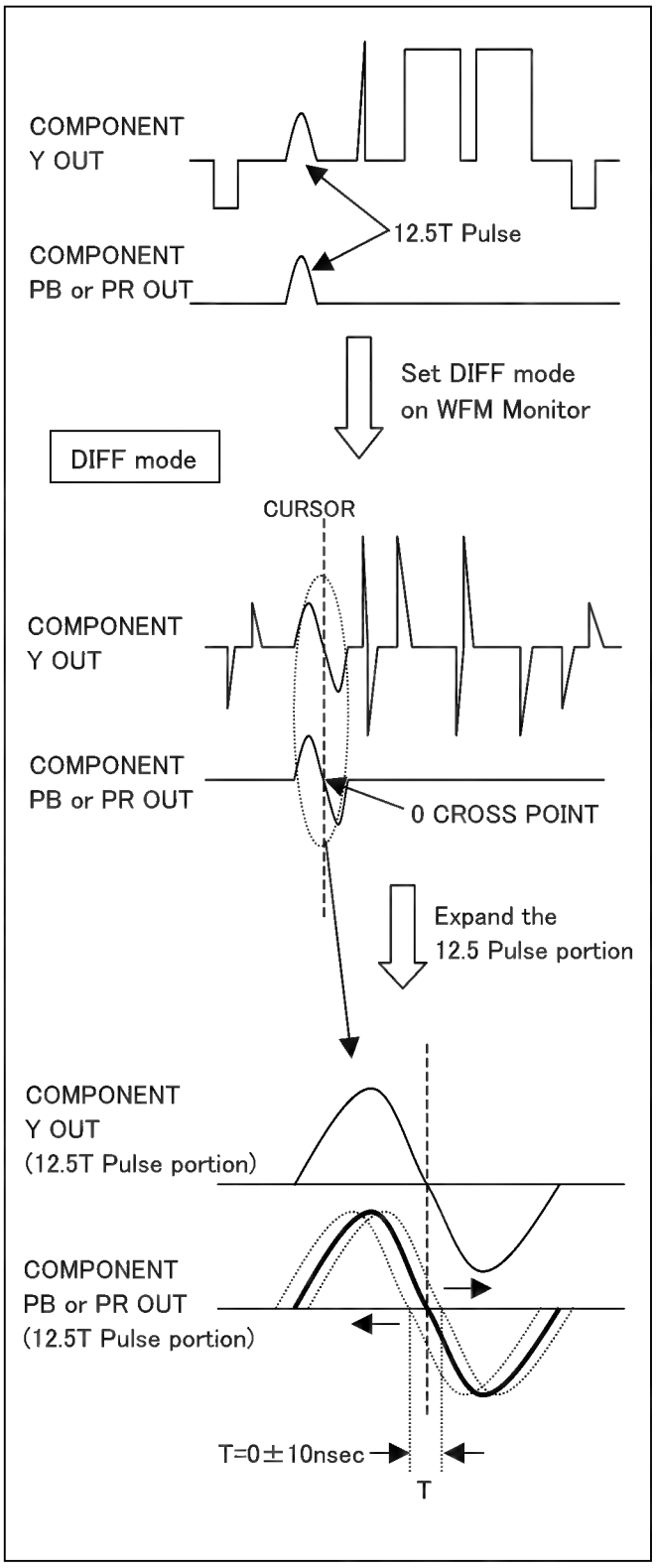


8-21. YC Timing Adjustment (YC)

P.C.B.	V_IN (F6)
SPEC.	T = 0±10nsec
TEST	Y PR PB OUT
ADJ.	VR461(F-1), VR465(F-1)
INPUT	S-VIDEO IN : 12.5T Pulse & Bar
MODE	EE
TAPE	----------
M.EQ	Waveform Monitor

7. Confirm that the 12.5T Pulse & Bar signal appeared correctly on the scope with Component Y OUT as shown in figure.
8. Confirm that the 12.5T Pulse portion appeared correctly on the scope with Component PB and PR OUT as shown in figure.
9. Set WFM monitor to DIFF mode. In case of set the DIFF mode, waveform of Y, PB and PR signals are integrated as shown in figure.
10. Expand the 12.5 pulse portion (an ellipse dotted portion as indicated as figure) and set the cursor to 0 cross point as shown in figure.
11. Sine-wave is appeared on the scope by expansion as shown in figure.
12. Adjust VR461(PB) and VR465(PR) so that the phase synchronized between Y and PB, PR signals.

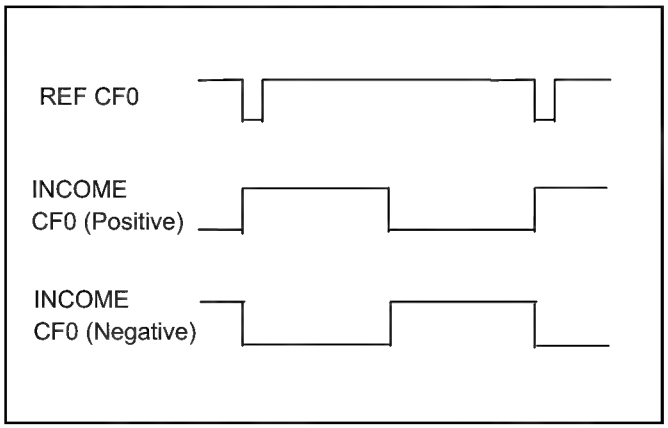
NOTE: Please use type of WFM Monitor attached DIFF mode



8-22. YC SCH Detection Adjustment

P.C.B.	V_IN (F6)
SPEC.	See below
TEST	CF OUT (TEST SIG GEN) Connector P2-8C (INCOME CF0 pulse)
ADJ.	VR407(H-2)
INPUT	S-VIDEO: 75% Color Bar (Set up 7.5%)
MODE	EE
TAPE	----------
M.EQ	Oscilloscope

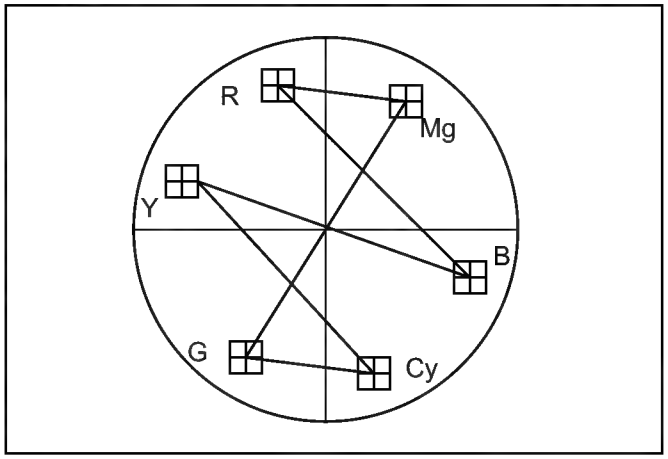
1. Set VR407 fully CCW.
2. If Income CF0 pulse does not negative pulse, slowly turn VR407 CW and set the position where the Income CF0 pulse just changes from the positive to negative phase as shown in below figure.
3. Set the VR407 so that the phase of Income CF0 pulse just changes from the negative to positive position as shown in below figure. Memorized this adjusted position of VR as position A.
4. Set the VR407 so that the phase of Income CF0 pulse just changes from the positive to negative position as shown in below figure. Memorized this adjusted position of VR as position B.
5. Set the VR407 so that the center between position A and B.



8-23. Composite Vector Adjustment

P.C.B.	V_IN (F6)
SPEC.	All vector dots are In Inner Boxes
TEST	COMPOSITE OUT
ADJ.	VR409(G-2)
INPUT	COMPOSITE 75% Color Bar (Set up 7.5%)
MODE	EE
TAPE	----------
M.EQ	Vector Scope

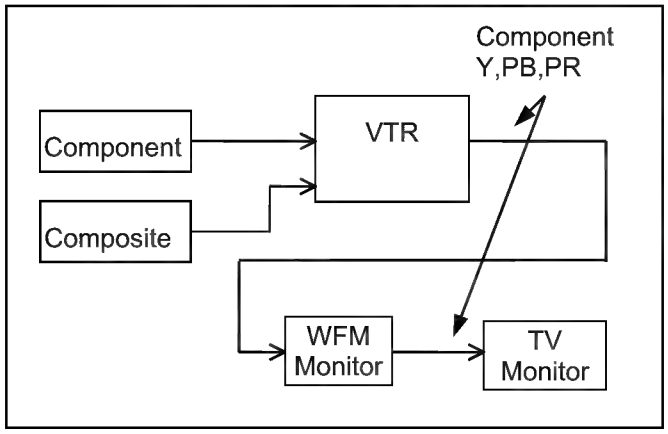
1. Adjust VR409 so that the all vector dots are in the inner boxes.



8. V IN P. C. Board
[AJ-D450 only: For PAL]

8-1. Preparation for Video In Adjustment

1. Connect the equipment as shown in the figure.
2. V IN P.C.Board adjustment should be performed after the V OUT P.C.Board adjustment.



8-2. 13.5MHz VCO Adjustment

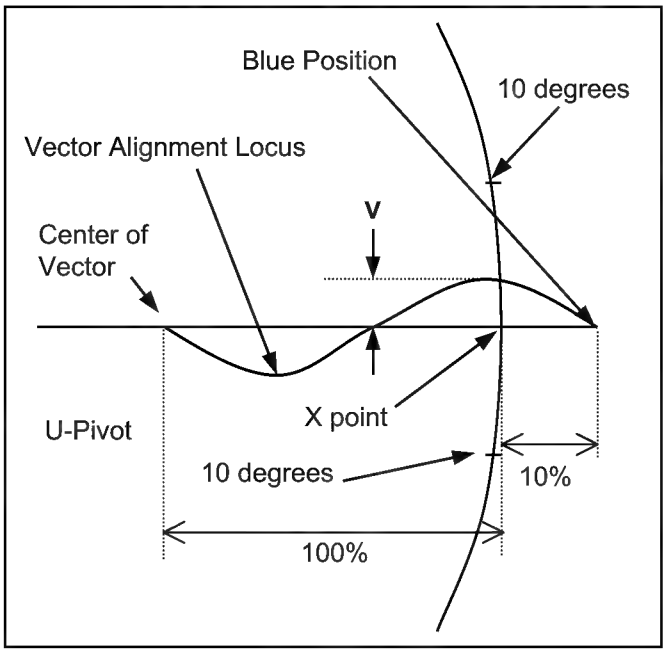
P.C.B.	V_IN (F6)
SPEC.	0V± 0.1V
TEST	TP553(E-2)
ADJ.	VL551(F-3), VR552(F-2)
INPUT	Component 100% Colour Bar
MODE	EE
TAPE	----------
M.EQ	Oscilloscope

1. Set VR552 to center position.
2. Adjust VL551 so that the DC Voltage is 0V± 0.1V.
   ＊ First, turn VL551 to CCW.

8-3. Component Y Timing Adjustment

P.C.B.	V_IN (F6)
SPEC.	V =±0.5 degree
TEST	VIDEO OUT 1
ADJ.	VR551(E-2)
INPUT	Composite 100% Colour Bar
MODE	EE
TAPE	----------
M.EQ	Vector Scope

1. Connect the vector scope to composite out terminal.
2. Expand the Vector Alignment Locus, where the blue point position on vector scale (X point as shown in below figure) and set the vector Alignment Locus on the u-pivot by adjust gain and phase VR on the vector scope.
3. Expand the Vector Alignment Locus 10% as compare with 100% as shown in below figure.
4. Adjust VR551 so that the vector adjustment locus is become straight, it should be in specification.



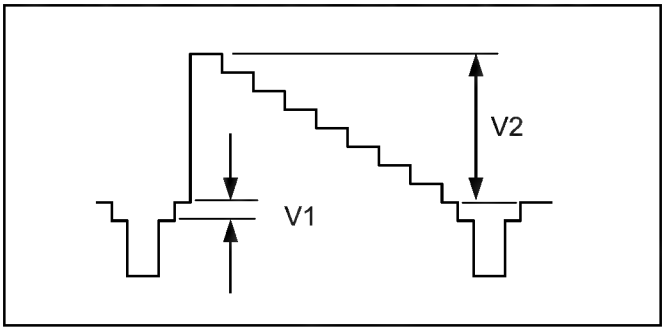
NOTE: In case of use VM700A

1. Set the blue point position to tip of U-Pivot.
2. Set the Average ON of VM700A
3. Adjust VR551 so that the vector adjustment locus is match to X point, and it should be in specification.

8-4. Component Y Level Adjustment

P.C.B.	V_IN (F6)
SPEC.	V1 = 0V±7mV, V2 = 700mV±7mV
TEST	Y OUT
ADJ.	VR652(C-2), VR651(C-3)
INPUT	Component 100% Colour Bar
MODE	EE
TAPE	----------
M.EQ	Waveform Monitor

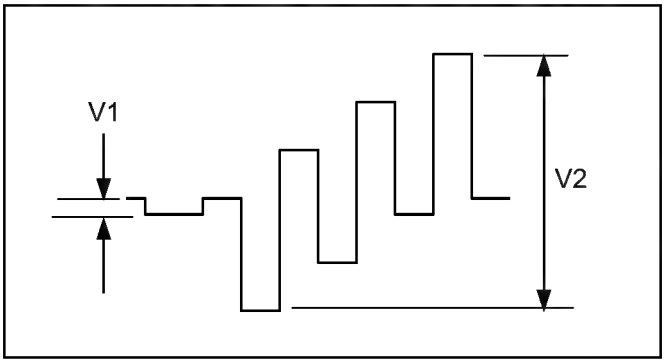
1. Adjust VR652 so that the V1 is 0V±7mV.
2. Adjust VR651 so that the V2 is 700mV±7mV.



8-5. Component PB Level Adjustment

P.C.B.	V_IN (F6)
SPEC.	V1 = 0V±7mV, V2 = 700mV±7mV
TEST	PB OUT
ADJ.	VR703(A-2), VR702(A-2)
INPUT	Component 100% Colour Bar
MODE	EE
TAPE	----------
M.EQ	Waveform Monitor

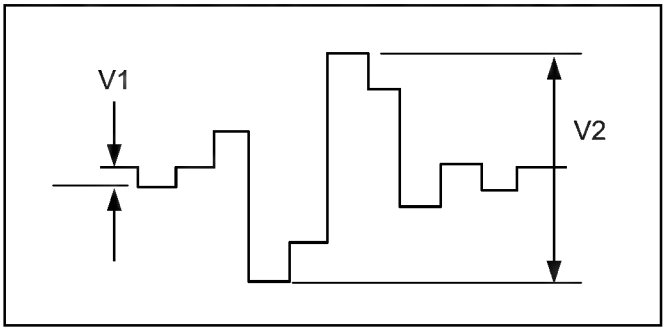
1. Adjust VR703 so that the V1 is 0±7mV.
2. Adjust VR702 so that the V2 is 700m±7mV.



8-6. Component PR Level Adjustment

P.C.B.	V_IN (F6)
SPEC.	V1 = 0V±7mV, V2 = 700mV±7mV
TEST	PR OUT
ADJ.	VR753(A-1), VR752(B-1)
INPUT	Component 100% Colour Bar
MODE	EE
TAPE	----------
M.EQ	Waveform Monitor

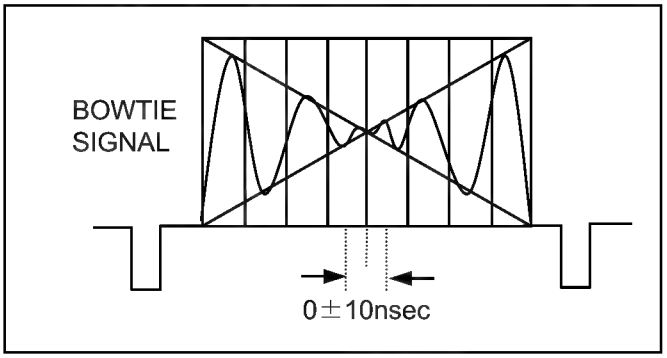
1. Adjust VR753 so that the V1 is 0V±7mV.
2. Adjust VR752 so that the V2 is 700mV±7mV.



8-7. Component Y/C Timing Adjustment

P.C.B.	V_IN (F6)
SPEC.	0±10nsec
TEST	Y, PB, PR OUT
ADJ.	VR701(B-2), VR751(B-1)
INPUT	Component IN : BOWTIE
MODE	EE
TAPE	----------
M.EQ	Waveform Monitor

1. Adjust VR701(PB) so that the minimum level of the Y/PB timing signal is 0±10nsec against the center scale.
   Adjust VR751(PR) so that the minimum level of the Y/PB timing signal is 0±10nsec against the center scale.

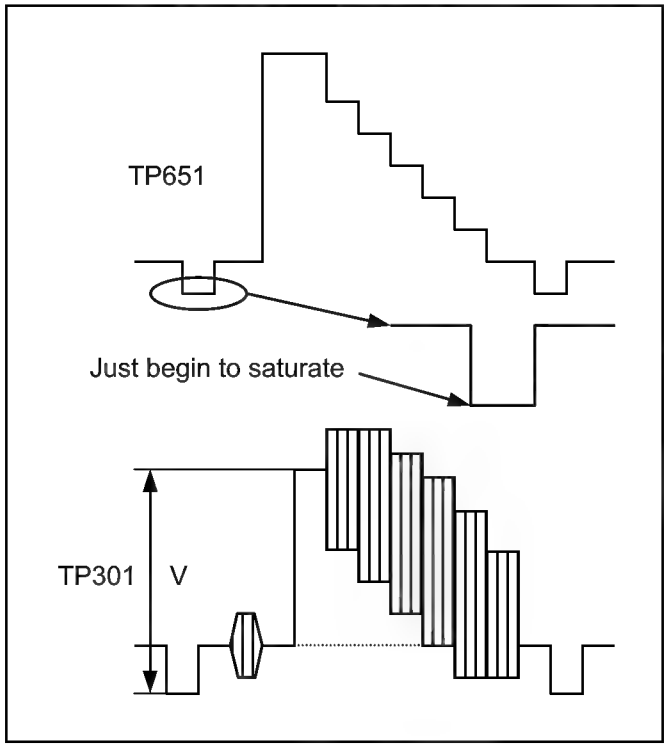


8-8. Composite Input Level Adjustment

P.C.B.	V_IN (F6)
SPEC.	V1 = 1.6V±0.02V
TEST	TP651(C-3), TP301(I-3)
ADJ.	VR301(I-2), VR251(I-3)
INPUT	COMPOSITE 100% Colour Bar
MODE	EE
TAPE	----------
M.EQ	Oscilloscope

1. Observe TP651 and adjust VR301 at the point where the sync tip just begin to saturate.
2. Adjust VR251 so that the voltage at TP301 is 1.6V ±0.02V.

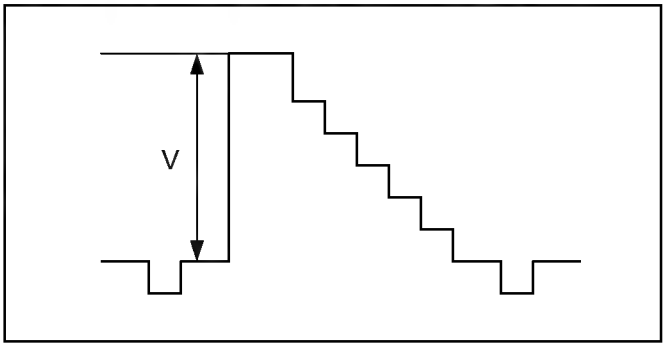
   NOTE: Oscilloscope trigger should be connect to Connector P2-16a



8-9. Composite Y Level Adjustment

P.C.B.	V_IN (F6)
SPEC.	V = 700mV±7mV
TEST	Y OUT
ADJ.	VR352(I-1)
INPUT	COMPOSITE 100% Colour Bar
MODE	EE
TAPE	----------
M.EQ	Waveform Monitor

1. Adjust VR352 so that the V is 700mV±7mV.

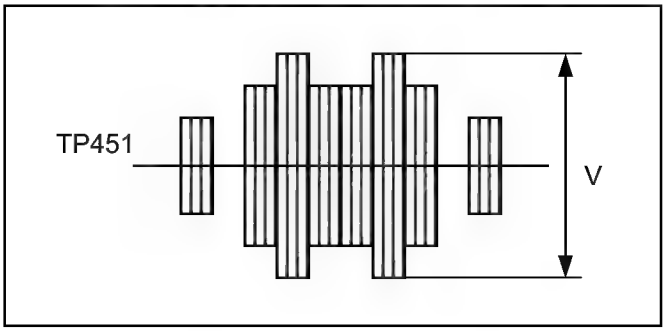


8-10.Composite Colour Level Adj.

P.C.B.	V_IN (F6)
SPEC.	V = 500mV±20mV
TEST	TP451(H-1)
ADJ.	VR351(I-1)
INPUT	COMPOSITE 100% Colour Bar
MODE	EE
TAPE	----------
M.EQ	Waveform Monitor

1. Adjust VR351 so that the V is 500mV±20mV.

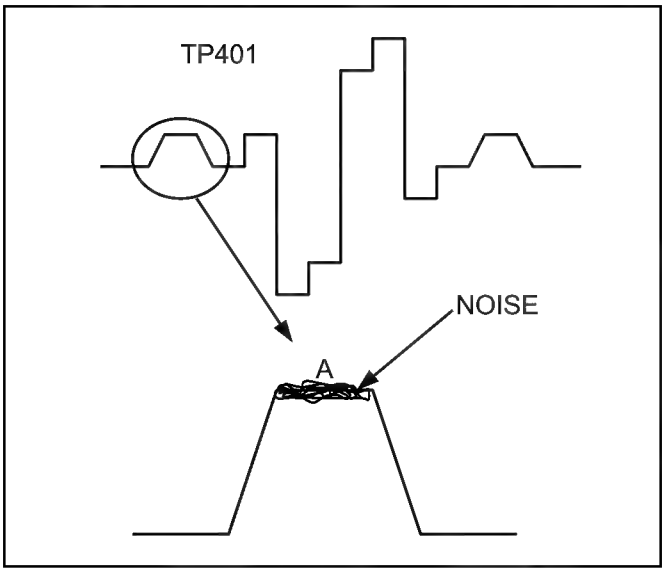
   NOTE: Oscilloscope trigger should be connect to Connector P2-16a.



8-11. Composite Colour Demodulation Adjustment

P.C.B.	V_IN (F6)
SPEC.	See figure
TEST	TP401(F-2)
ADJ.	VR408(H-2), VR409(G-2)
INPUT	COMPOSITE 100% Colour Bar
MODE	EE
TAPE	----------
M.EQ	Oscilloscope

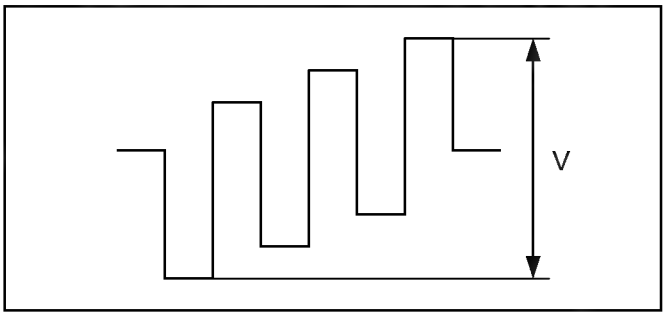
1. Adjust VR409 so that the waveform is shown in figure (no double image).
2. Adjust VR408 so that the noise portion is positioned on the top of A portion as shown in figure.



8-12. Composite PB Level Adjustment

P.C.B.	V_IN (F6)
SPEC.	V = 700mV±7mV
TEST	PB OUT
ADJ.	VR460(G-1)
INPUT	COMPOSITE 100% Colour Bar
MODE	EE
TAPE	----------
M.EQ	Waveform Monitor

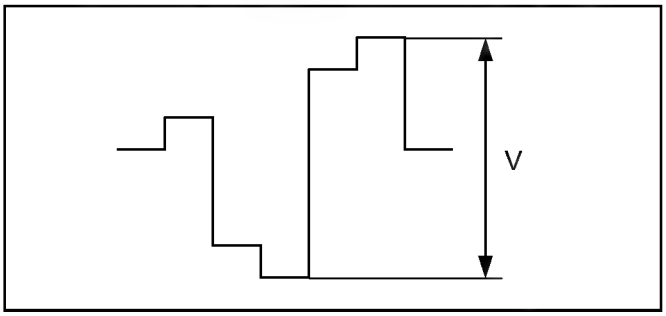
1. Adjust VR460 so that the V is 700mV±7mV



8-13. Composite PR Level Adjustment

P.C.B.	V_IN (F6)
SPEC.	V = 700mV±7mV
TEST	PR OUT
ADJ.	VR464(F-1)
INPUT	COMPOSITE 100% Colour Bar
MODE	EE
TAPE	----------
M.EQ	Waveform Monitor

1. Adjust VR464 so that the V is 700mV±7mV.

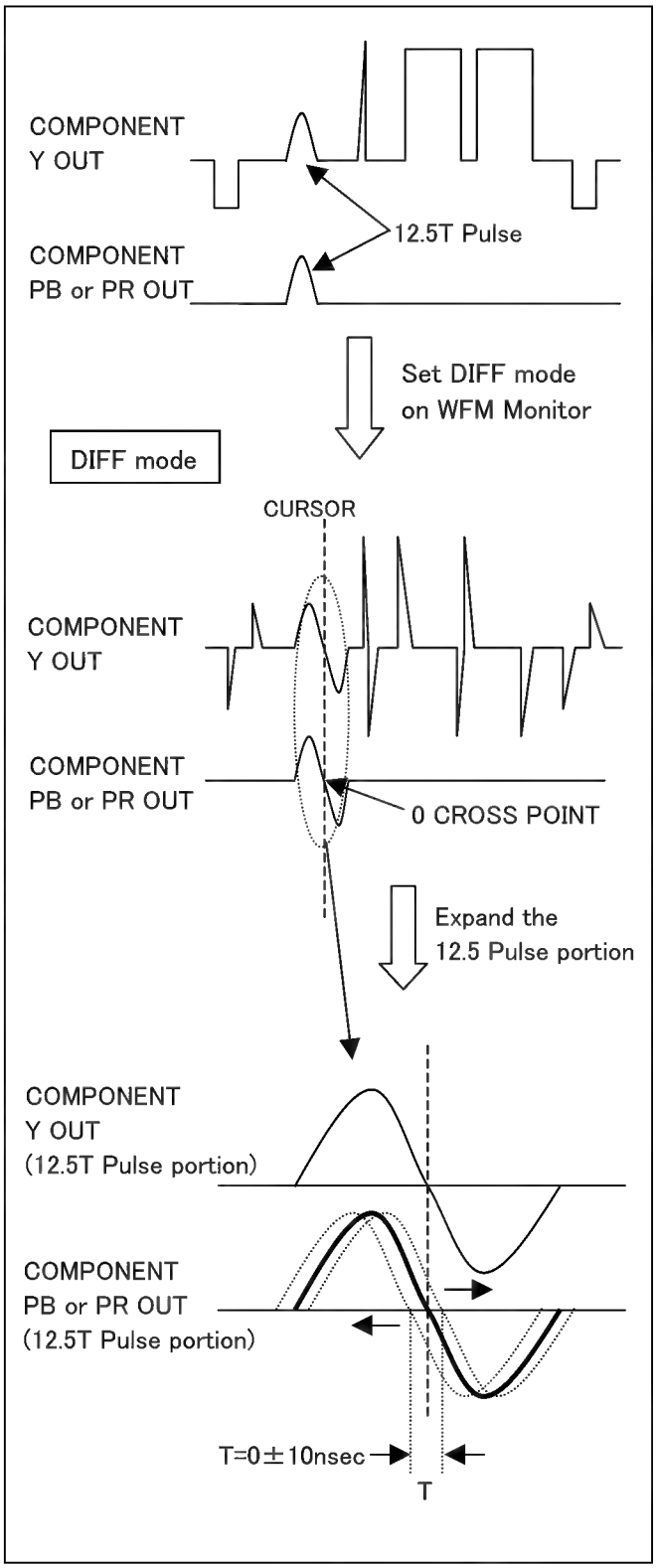


8-14. Composite YC Timing Adjustment

P.C.B.	V_IN (F6)
SPEC.	T = 0±10nsec
TEST	Y PR PB OUT
ADJ.	VR459(G-1), VR463(G-1)
INPUT	Composite IN : 12.5T Pulse & Bar
MODE	EE
TAPE	----------
M.EQ	Waveform Monitor

1. Confirm that the 12.5T Pulse & Bar signal appeared correctly on the scope with Component Y OUT as shown in figure.
2. Confirm that the 12.5T Pulse portion appeared correctly on the scope with Component PB and PR OUT as shown in figure.
3. Set WFM monitor to DIFF mode. In case of set the DIFF mode, waveform of Y, PB and PR signals are integrated as shown in figure.
4. Expand the 12.5 pulse portion (an ellipse dotted portion as indicated as figure) and set the cursor to 0 cross point as shown in figure.
5. Sine-wave is appeared on the scope by expansion as shown in figure.
6. Adjust VR459(PB) and VR463(PR) so that the phase synchronized between Y and PB, PR signals.

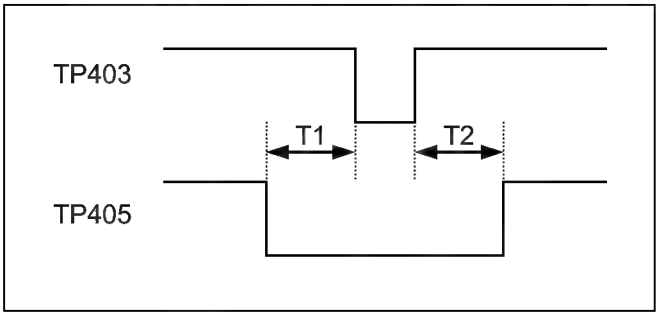
NOTE: Please use type of WFM Monitor attached DIFF mode



8-15. Composite SCH Detection Adjustment

P.C.B.	V_IN (F6)
SPEC.	T1－T2＝±0.5msec
TEST	TP403(G-2), TP405(G-2)
ADJ.	VR407(H-2)
INPUT	COMPOSITE 100% Colour Bar
MODE	EE
TAPE	----------
M.EQ	Oscilloscope

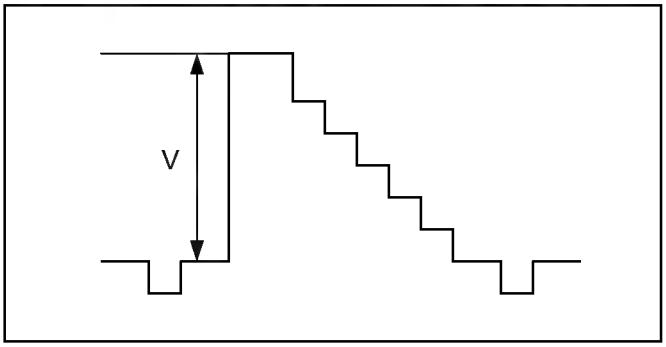
1. Adjust VR407 so that the T1 and T2 in specification.



8-16. YC Y Level Adjustment

P.C.B.	V_IN (F6)
SPEC.	V = 700mV±7mV
TEST	Y OUT
ADJ.	VR354(H-1)
INPUT	S-VIDEO: 100% Colour Bar
MODE	EE
TAPE	----------
M.EQ	Waveform Monitor

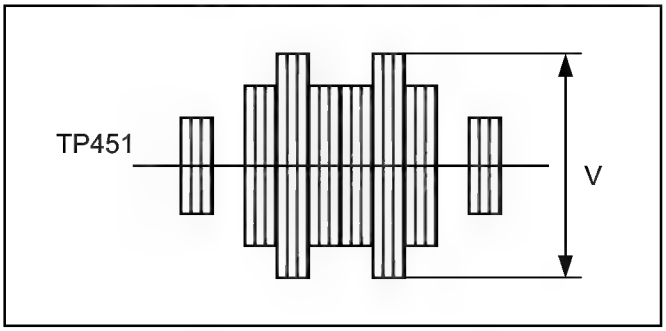
1. Adjust VR354 so that the V is 700mV±7mV.



8-17.YC Colour Level Adj.

P.C.B.	V_IN (F6)
SPEC.	V = 500mV±20mV
TEST	TP451(H-1)
ADJ.	VR353(H-2)
INPUT	S-VIDEO: 100% Colour Bar
MODE	EE
TAPE	----------
M.EQ	Waveform Monitor

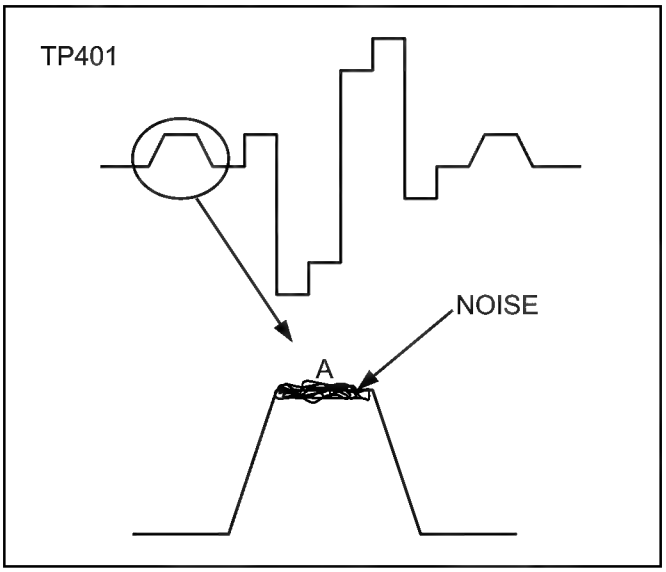
1. Adjust VR353 so that the V is 500mV±20mV.
   NOTE: Oscilloscope trigger should be connect to Connector P2-16a.



8-18. YC Colour Demodulation Adjustment

P.C.B.	V_IN (F6)
SPEC.	See figure
TEST	TP401(F-2)
ADJ.	VR409(G-2), VR410(G-2)
INPUT	S-VIDEO: 100% Colour Bar
MODE	EE
TAPE	----------
M.EQ	Oscilloscope

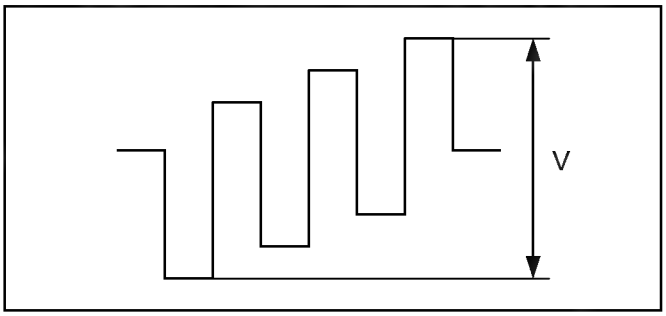
1. Adjust VR409 so that the waveform is shown in figure (no double image).
2. Adjust VR408 so that the noise portion is positioned on the top of A portion as shown in figure.



8-19. YC PB Level Adjustment

P.C.B.	V_IN (F6)
SPEC.	V = 700mV±7mV
TEST	PB OUT
ADJ.	VR462(F-1)
INPUT	S-VIDEO: 100% Colour Bar
MODE	EE
TAPE	----------
M.EQ	Waveform Monitor

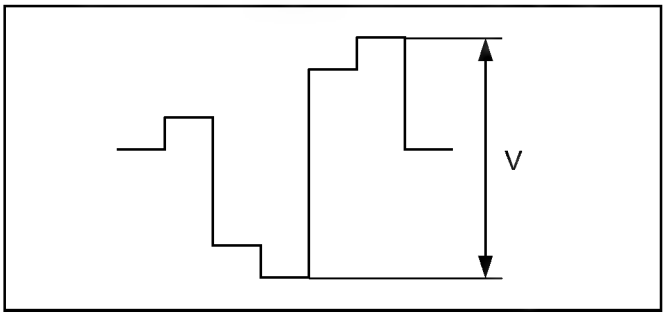
1. Adjust VR462 so that the V is 700mV±7mV



8-20. YC PR Level Adjustment

P.C.B.	V_IN (F6)
SPEC.	V = 700mV±7mV
TEST	PR OUT
ADJ.	VR466(E-1)
INPUT	S-VIDEO: 100% Colour Bar
MODE	EE
TAPE	----------
M.EQ	Waveform Monitor

1. Adjust VR466 so that the V is 700mV±7mV.

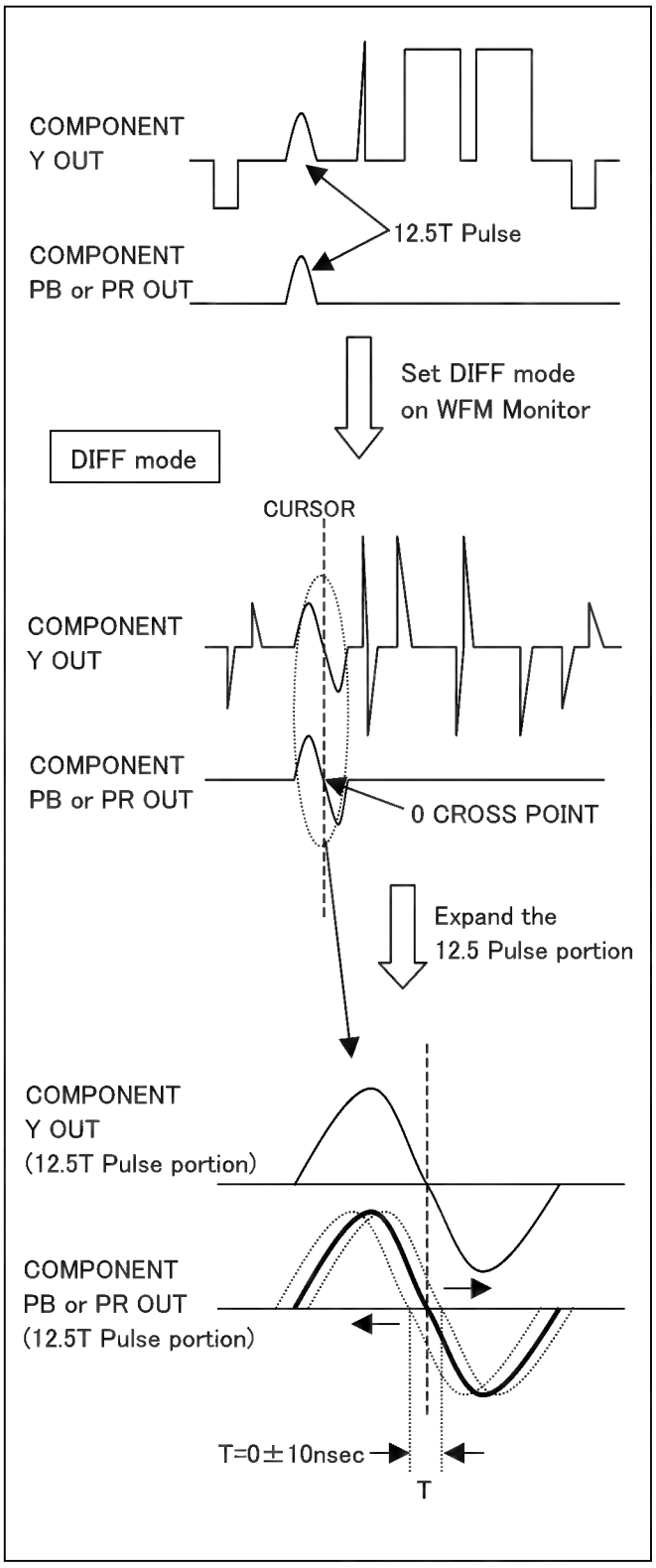


8-21. YC Timing Adjustment (YC)

P.C.B.	V_IN (F6)
SPEC.	T = 0±10nsec
TEST	Y PR PB OUT
ADJ.	VR461(F-1), VR465(F-1)
INPUT	S-VIDEO IN : 12.5T Pulse & Bar
MODE	EE
TAPE	----------
M.EQ	Waveform Monitor

7. Confirm that the 12.5T Pulse & Bar signal appeared correctly on the scope with Component Y OUT as shown in figure.
8. Confirm that the 12.5T Pulse portion appeared correctly on the scope with Component PB and PR OUT as shown in figure.
9. Set WFM monitor to DIFF mode. In case of set the DIFF mode, waveform of Y, PB and PR signals are integrated as shown in figure.
10. Expand the 12.5 pulse portion (an ellipse dotted portion as indicated as figure) and set the cursor to 0 cross point as shown in figure.
11. Sine-wave is appeared on the scope by expansion as shown in figure.
12. Adjust VR461(PB) and VR465(PR) so that the phase synchronized between Y and PB, PR signals.

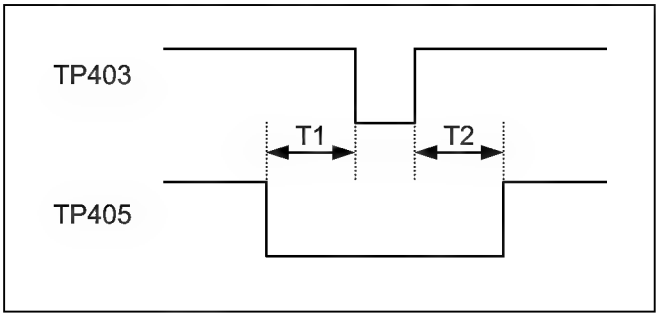
NOTE: Please use type of WFM Monitor attached DIFF mode



8-22. YC SCH Detection Adjustment

P.C.B.	V_IN (F6)
SPEC.	See below
TEST	TP403(G-2), TP405(G-2)
ADJ.	VR407(H-2)
INPUT	S-VIDEO: 100% Colour Bar
MODE	EE
TAPE	----------
M.EQ	Oscilloscope

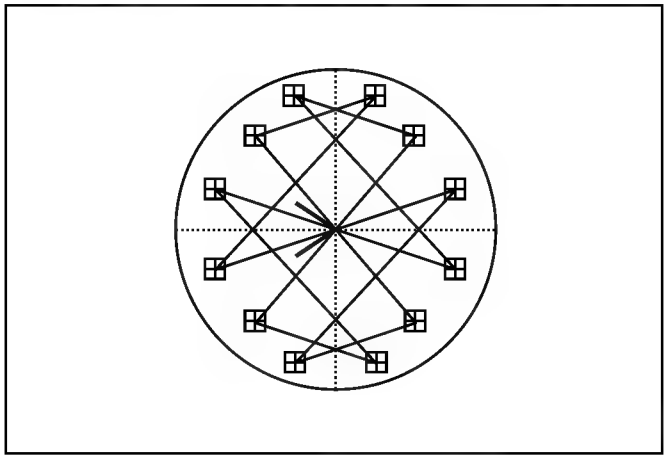
1. Adjust VR407 so that the T1 and T2 in specification.



8-23. Composite Vector Adjustment

P.C.B.	V_IN (F6)
SPEC.	All vector dots are In Inner Boxes
TEST	VIDEO OUT 1
ADJ.	VR409(G-2)
INPUT	COMPOSITE 100% Colour Bar
MODE	EE
TAPE	----------
M.EQ	Vector Scope

1. Adjust VR409 so that the all vector dots are in the inner boxes.



9. ADDA CUE (F8)

9-1. Initial Setting of PCM Adjustment

< Switch Setting >

1. Set the switch as shown below.

Ref No.	Name	Setting Position
SW4381	NR SELECT	NORMAL

< Setting of Front switches >

NAME	Setting Position
HEAD PHONES	MIX
HR VR	CENTER
REMOTE/LOCAL	LOCAL

< User Menu Setting >

Open the AUDIO item (No. 700 series) of the SETUP-MENU and set the items as shown below.

Item No.	Name	Setting Value
700	MONIL OUT LEV	0 dB
701	MONIR OUT LEV	0 dB
702	MONI CH SEL	AUTO1
703	MONI OUT SEL	PCM

< Measurement Equipment Setting >

In case of use Audio Precision, please set switches as shown below.

OSC Output Impedance	Less than 50 ohm (Balance Out)
Input Impedance	More than 100Kohm (Balance In)

9-2. Output Level Adjustment(AJ-D450)

P.C.B.	ADDA CUE(F8)
SPEC.	0dBu±0.1dBu
TEST	AUDIO OUT: CH1, CH2
ADJ.	VR4221 (CH1), VR4281 (CH2)
INPUT	INT Signal
MODE	EJECT
TAPE	----------
M.EQ	Audio Analyzer VTVM(Audio Precision)

1. Open Set up menu and set the item “No.722:INT SG” to ON.
2. Adjust VR4221 so that the CH1 level is in the specification.
3. Adjust VR4281 so that the CH2 level is in the specification.
4. Confirm all channels that the sine-wave output is normal.

9-2. Output Level Adjustment(AJ-D440)

P.C.B.	ADDA CUE(F8)
SPEC.	0dBu±0.1dBu
TEST	AUDIO OUT: CH1, CH2
ADJ.	VR4221 (CH1), VR4281 (CH2)
INPUT	----------
MODE	PLAY
TAPE	NTSC: VFM3580KM PAL: VFM3680KM
M.EQ	Audio Analyzer VTVM(Audio Precision)

1. Adjust VR4221 so that the CH1 level is in the specification.
2. Adjust VR4281 so that the CH2 level is in the specification.
3. Confirm all channels that the sine-wave output is normal.

9-3. Monitor Output Level Adjustment (AJ-D450)

P.C.B.	ADDA CUE(F8)
SPEC.	-0.8dBV ± 0.2dB
TEST	MONITOR OUT
ADJ.	VR4341
INPUT	INT Signal
MODE	EJECT
TAPE	---------
M.EQ	Audio Analyzer VTVM (Audio Precision)

1. Open the Set Up menu and set the items " 722: INT SG " to ON.
2. Adjust VR4341 so that the MONITOR OUT level is in the specification.
3. Confirm MONITOR OUT that the sine-wave output is normal.

9-3. Monitor Output Level Adjustment (AJ-D440)

P.C.B.	ADDA CUE(F8)
SPEC.	-0.8dBV ± 0.2dB
TEST	MONITOR OUT
ADJ.	VR4341
INPUT	---------
MODE	PLAY
TAPE	NTSC:VFM3580KM PAL:VFM3680KM
M.EQ	Audio Analyzer VTVM (Audio Precision)

1. Adjust VR4341 so that the MONITOR OUT level is in the specification.
2. Confirm MONITOR OUT that the sine-wave output is normal.

9-4. Input Level Adjustment (Only AJ-D450)

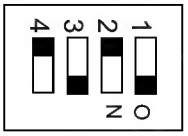
P.C.B.	ADDA CUE(F8)
SPEC.	-0.2dBm ± 0.1dB
TEST	AUDIO OUT (CH1, CH2)
ADJ.	VR4002 (CH1), VR4062 (CH2)
INPUT	1kHz 0dBm Sine-wave (BAL)
MODE	EE
TAPE	----------
M.EQ	Audio Analyzer VTVM (Audio Precision)

1. Adjust VR4002 so that the CH1 level is in the specification.
2. Adjust VR4062 so that the CH2 level is in the specification.

9-5. Initial Setting of CUE Adjustment

< Setting of switches on P.C.Board >

Set the switches indicated as below.

Ref No.	Name of SW	Position
SW4001	CH1 input Impedance	HIGH
SW4061	CH2 input Impedance	HIGH
SW4382	NR Select	NORMAL
SW4381	REC EQ	 1,3 ON

Note: In case of SW4001, 4061 and 4382 did not install on P.C.Board, those 3 switches setting no required.(Case of AJ-D440)

< Measurement Equipment Setting >

In case of use Audio Precision, please set switches as shown below.

OSC Output Impedance	Less than 50 ohm (Balance Out)
Input Impedance	More than 100Kohm (Balance In)

< Service Menu Setting >

Open the AUDIO ADJUST menu on Service menu and set item " E04: LINE OUT CUE " to ON.

9-6. CUE Erase Frequency Adj. (Only AJ-D450)

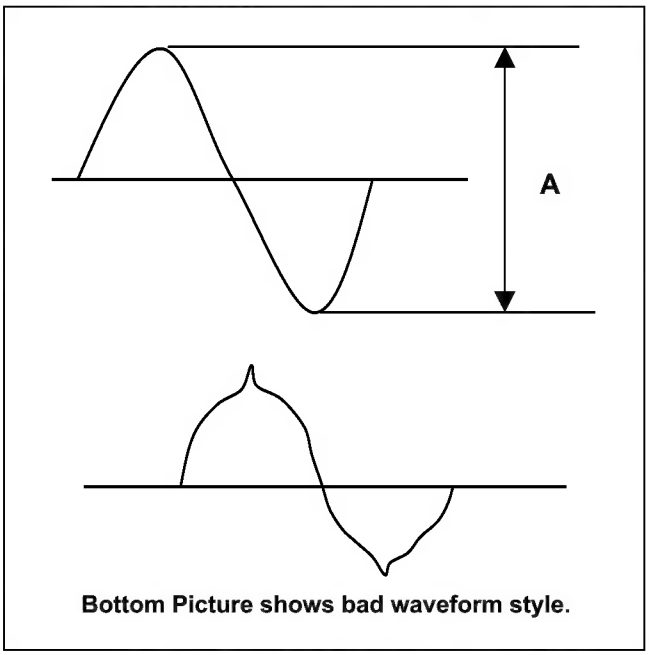
P.C.B.	ADDA CUE (F8)
SPEC.	70kHz±0.2kHz
TEST	TP4501, TG4501 (GND)
ADJ.	T4501
INPUT	----------
MODE	REC
TAPE	Blank Tape
M.EQ	Frequency Counter

1. Adjust T4501 so that the frequency level is in the specification.

9-7. CTL Erase / CUE Erase Current Adjustment (Only AJ-D450)

P.C.B.	ADDA CUE (F8)
SPEC.	A = 290mVp-p±50mV
TEST	TP4501 (CUE), TP4502 (CTL) TG4501 (GND)
ADJ.	T4503 (CUE), T4504 (CTL)
INPUT	----------
MODE	REC
TAPE	Blank Tape
M.EQ	Oscilloscope

1. Adjust T4501 so that the voltage at TP4503 is in the specification.
2. Adjust T4504 so that the voltage at TP4502 is in the specification.



Bottom Picture shows bad waveform style.

9-8. CUE Bias Current Adjustment (Only AJ-D450)

P.C.B.	ADDA CUE (F8)
SPEC.	7 mVrms ± 0.5 mVrms (19.7mVp-p ± 1.5mVp-p)
TEST	TP4382, (GND: TP4383)
ADJ.	T4501, VR4501
INPUT	----------
MODE	REC
TAPE	Blank Tape
M.EQ	Vacuum Tube Volt Meter

1. Connect the Vacuum Tube Volt Meter between TP4382 and TP4383(GND) and confirm the voltage is in the specification.
2. If it is out of specification, adjust T4501 so that the level becomes maximum and adjust VR4501 so that the level is in the specification.

9-9. CUE PB Level Adjustment

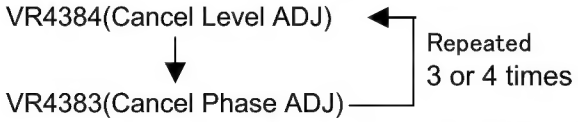
P.C.B.	ADDA CUE (F8)
SPEC.	0dBu ± 0.5dBu
TEST	AUDIO OUT (CH1)
ADJ.	VR4382(PB LEVEL)
INPUT	----------
MODE	PLAY
TAPE	NTSC: VFM3580KM (0 to 7 min) PAL: VFM3680KM (0 to 10 min)
M.EQ	VTVM (Audio Precision)

1. Playback the alignment tape and adjust VR4382 so that the CUE OUT(AUDIO OUT: CH1) level is in the specification.

9-10.CUE Noise Cancel Adjustment

P.C.B.	ADDA CUE (F8)
SPEC.	Minimum of error rate or Noise level = Less than –40dBu
TEST	TP4381 or AUDIO OUT(CH1)
ADJ.	VR4383, VR4384
INPUT	----------
MODE	PLAY
TAPE	Blank Tape (NO Signal Recorded portion)
M.EQ	Audio Analyzer Oscilloscope (Audio Precision)

1. Connect the TP4381 to scope and observe the noise level of TP4381.
2. Adjust VR4383 and VR4384 so that the noise level is minimum follow the below procedure.



3. In case of use Audio Precision, set indicated as below and connect AUDIO OUT to Audio Precision.
   - ∗ MEASURE: BANDPASS
   - ∗ BP/BR FREQ: 600Hz
   - ∗ FILTER: OFF
4. Adjust VR4383 and VR4384 so that the noise level is in the specification follow the above procedure (item 2).

9-11. CUE REC/PB Level Adjustment (Only AJ-D450)

P.C.B.	ADDA CUE (F8)
SPEC.	0dBu ± 1dBu
TEST	AUDIO OUT (CH1,CH2)
ADJ.	VR4381(REC CURR)
INPUT	LINE IN(CH1,CH2) : 1KHz, 0dBu Sine-wave (BAL)
MODE	REC
TAPE	Blank Tape
M.EQ	Audio Analyzer VTVM (Audio Precision)

1. Supply a 1KHz, 0dBu signal into the LINE Input and record the input signal for a few minutes.
2. Playback the just recorded portion.
3. Adjust VR4381 so that the CUE OUT (AUDIO OUT) level is in the specification.

NOTE: In case of use Audio Precision, set indicated as below.
- ∗ MEASURE: AMPLITUDE
- ∗ BP/BR FREQ: AUTO
- ∗ FILTER: OFF
- ∗ BANDWIDTH: 22Hz, 22KHz